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DIRECTOR OF INSTITUTE OF PATHOLOGY, CHARING CROSS HOSPITAL.

LECTURE III.[1]

MR. PRESIDENT, LADIES, AND GENTLEMEN,—In the experiments recorded in my last lecture a culture of *B. Danysz* was fed to a certain number of mice, and from one of these, killed 24 hours after feeding, a second strain of the bacillus was isolated. This was fed to a further series of mice, and from the tissues of certain of the animals which died, or were killed when dying, during the course of this experiment further strains were isolated. These in their turn were fed to other batches of mice, and the process was repeated many times. The whole series of experiments lasted over about nine months.

Consideration of the results showed that two strains at least possessed, when first isolated, a greatly increased tendency to produce a fatal illness in mice when administered with food. Retesting of these strains at later periods confirmed their high pathogenicity, but indicated a gradual return to the original conditions under artificial cultivation. In many cases, however, the strain isolated from a mouse of a given experiment proved less pathogenic on being fed to other mice than the strain on which the mouse itself had been fed, and this was particularly true of those strains which were isolated from mice which were found dead. Each of the two strains which possessed especially high pathogenicity rapidly lost this characteristic on further passage carried out in this way.

In view of the interesting results which have been obtained by close serological study of different races of the same bacterial species, it seemed desirable to investigate the most divergent strains along these lines. High-titre agglutinating sera were obtained for six of these, and 48 strains of *B. Danysz* isolated during the course of these experiments were tested as regards their relative agglutinability and by cross-absorption tests. In every case the exact limit of agglutination was determined. The results failed to distinguish in any way between the strains examined.

EXPERIMENTS WITH A VIEW OF REPRODUCING NATURAL CONDITIONS.

It is difficult to decide how far the conditions in these experiments reproduce those met with in nature. In so far as natural infection occurs by normal mice devouring their companions who have succumbed to the disease, they must be very similar. If, however, the main source of infection under natural circumstances is the consumption by normal animals of food soiled with the excreta of those which are infected, there will be additional factors which are absent in the experiments we have considered. There seems little doubt that the latter mode of infection is by far the more important, and we are therefore not justified in assuming that such results as have been obtained represent what happens when passage occurs under natural conditions. They form, however, a valuable guide in interpreting the results obtained in other experiments, in which the conditions were arranged to reproduce, as closely as possible, the sequence of events which must actually occur in the epidemic spread of disease.

In these experiments a certain number of mice were fed on a strain of *B. Danysz*. Next day they were transferred to a clean cage, and at varying periods thereafter normal mice were added to the cage. These were identified in some way, sometimes by merely noting the colour markings, sometimes by marking them with some distinctive dye. The deaths were noted as they occurred, and where possible post-mortem examinations were carried out. In some experiments several of the mice were found partially eaten. In one of them only were a certain number of dead mice left in the cage for their companions to devour. The results yielded no evidence that this factor modified the course of events in any way.

The charts in which the results of some of these experiments are shown are constructed as follows. On the upper base-line are recorded the deaths as they occurred in time. On the lower base-line are recorded the number of mice fed, the number of normal mice added, and the time at which the addition was made. The figures below the base-lines indicate days. Each square, representing a death or the addition of a normal mouse, is numbered, and the numbers correspond; so that the death of each mouse added can be traced as regards the time of its occurrence. The mice which died are represented by hatched squares in each case, so that the plain squares on the lower base-line correspond to normal mice which were added to the cage but survived.

Results of Experiments.

The results of one such experiment are recorded in Chart IV. Six mice were fed on a culture of *B. Danysz*. Five days later six normal mice were added to the cage. Three days later one of these was found dead. On the fourth day from this the first death occurred among the mice ordinarily fed, and one of these mice was found dead on each of the next three days. One of the mice added on the 6th day of the experiment succumbed on the 14th day and three on the 15th. On this day four more normal mice were added. One of these died three days later; the other three survived. Thus of six mice fed on this strain of the bacillus four died. Of six mice added between the date of feeding and the first death which occurred among the mice fed five died and one survived. Of four mice added on the 15th day of the experiment one died and three survived.

Chart V. shows the results of another experiment with a culture of the same strain of *B. Danysz*. It will be seen that of the eight mice fed on this culture five died. Of six normal mice added on the 7th day of the experiment, three died and three survived. Two mice were added on the 10th day, and three on the 14th. All of these survived.

Chart VI. shows a similar experiment with the original strain of *B. Danysz*. Of the eight mice originally fed four died. Three mice were added to the cage on the 14th day of the experiment. One of these died and the other two survived. Two mice were added on the 18th day, and both survived.

Thus in each of these three experiments when normal mice were added to the cage during the early stages a large proportion of them became infected and died of the disease. Mice added during the later stages, however, showed an increasing tendency to escape infection, and in some cases all the mice added at these later periods survived.

Chart VII. shows a similar experiment on a larger scale. It will be seen that it is referred to on the chart as an epidemic due to an unknown cause. The exact facts are as follows. The experiment was an attempt to ascertain whether strains of *B. Danysz*, possessing heightened pathogenicity, would be evolved as the result of natural passage, a possibility strongly suggested by the variation in this direction which had been observed in the passage experiments carried out in the manner indicated in my last lecture.

It had already been noted that mice exhibited a very definite age-susceptibility as regards infection with this organism. The experiments already considered were carried out with adult mice. When young mice were fed on the same culture an entirely different result was obtained. Thus in one experiment six young mice were fed on a 24-hour broth culture of this original strain. One was found dead next day, four on the day following, and the remaining mouse died on the 14th day.

An attempt was made to utilise this special susceptibility of young mice in the experiment under consideration. Four such mice were fed with a 24-hour broth culture of the original strain, and were transferred next day to the large cage in which this experiment was carried out. This was a long cage originally divided into 15 compartments, each of which would accommodate from two to four mice. A communication was made between each compartment, and the food was placed in a large centre compartment made by removing the two central partitions. At the time these four young mice were transferred to this cage one was obviously ill. It was found dying later the same day and was then killed and examined post mortem. Two more of these four mice were found dead on the 9th day after feeding. One was examined after death, the other was

[1] Lectures I. and II. were published in THE LANCET of July 5th (p. 1) and 12th (p. 45), 1919.

left in the cage to be eaten by its companions. The fourth mouse was found dead three days later, but was too decomposed for examination. Thus, two of the four original mice were examined post mortem. The cultures from one remained sterile; those from the other yielded only lactose-fermenting bacilli.

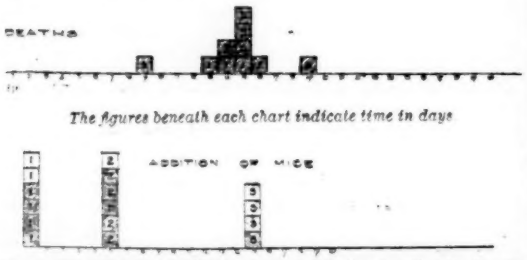


CHART IV.—Showing deaths in a cage in which were placed six mice (1) fed on a 24-hour broth culture of a strain of *B. danysz* (3 D, 21; 9, Spleen), and to which two further batches of normal mice were added (2, 3).

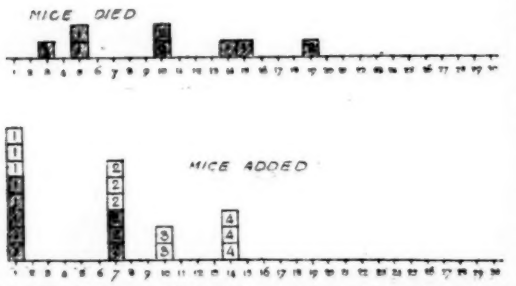


CHART V.—Showing results of feeding eight mice (1) on culture of same strain as in previous experiment, and adding normal mice to the cage at various intervals (2, 3, 4).

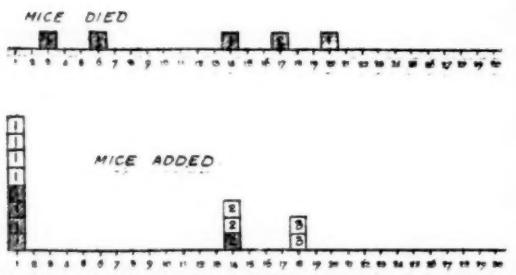


CHART VI.—Showing results of feeding eight mice on a culture of *B. danysz* (original strain) and adding normal mice.

Consideration of Results Shown in Chart VII.

The addition of normal mice and the deaths which occurred are sufficiently indicated in the chart. Of the 44 mice which died after being introduced to the cage 13 only were examined post mortem; most of the remaining dead mice were found almost entirely eaten, a difficulty which is particularly liable to be met with when large numbers of mice are allowed to live together. Of the 13 mice examined, seven yielded cultures of lactose-fermenting bacilli only, while the cultures from the remaining six mice remained sterile. Thus, during the course of the whole experiment *B. Danysz* was never isolated from any of the mice examined. In five of these 13 mice, however, the spleen was considerably enlarged, in five it was slightly enlarged, while in the other three it appeared normal. The post-mortem appearances were, in fact, entirely compatible with death from a *B. Danysz* infection, but in the entire absence of bacteriological confirmation it seems wiser to regard the cause of the epidemic as non-proven.

A point of some interest may, however, be noted. In all experiments of this kind it has been found that a most marked disproportion exists between the percentage of recoveries of *B. Danysz* from mice fed on cultures of this organism and from mice naturally infected through contact. Thus, while the bacillus has almost always been isolated from a considerable proportion of mice fed on cultures, other mice, dying in the same cage and during the same time interval, may yield entirely negative results. A high proportion of cultures from these mice remain sterile, while others yield lactose-fermenting organisms only. The number of mice examined so far has not been sufficient to exclude a mere chance coincidence, but the distribution of positive and negative results has been striking, and the matter is being investigated further.

Whatever the explanation may be, it does not directly concern us here. Regarding the course of events in the cage merely as a chance epidemic, the points already noted are evident again. The mice added in the early stages died. As the epidemic progressed a proportion of the newcomers survived. At a later stage, when deaths were still occurring in the cage, the risk of infection seemed to fall to a minimum, for almost all mice added at this stage survived.

EXPERIMENTAL EVIDENCE OF LOSS OF INFECTIVITY.

If we consider the results of these experiments one conclusion seems inevitable. Whatever part other factors may play, the cessation of the epidemic is actually due to the loss, on the part of the parasite, of the power to infect fresh individuals. It is impossible to conceive that in every experiment chance should have intervened by selecting especially resistant mice as the individuals to be added during the later stages.

Direct evidence on this point has been obtained in the following way. In the experiment recorded in Chart IV. there remained, at the time of the last death, six survivors. Twenty-three days later all these mice were alive and apparently in perfect health. On this day three normal mice were fed on a culture of the same strain of *B. Danysz* as that employed in the original feeding and were transferred to the cage later in the day. Fifteen days later a fresh outbreak of infection occurred, which lasted for five days and led to the death of two of the three mice which had been fed and added to the cage and of three of the six survivors from the original epidemic. It seems clear, therefore, that the surviving mice were not immune against the risk of naturally occurring infection.

Cross-infection in regard to Epidemic Period.

The evidence of the loss of infectivity on the part of the parasite, during the later stages of the spread of a *B. Danysz* infection among mice, finds support in certain observations on naturally occurring epidemics in man. In the paper already quoted Brownlee gives some striking figures regarding cross-infection in hospital wards from cases which were admitted for some other disease, but which were subsequently found to have been incubating measles. He has tabulated the number of such cases which did or did not lead to the infection of other patients in the ward, according as the incubating cases were admitted during the rise or decline of a measles epidemic or during an inter-epidemic period. Twenty-eight such cases were admitted during the ascent of the wave. In 24 of them cross-infection occurred. Four cases were admitted during the descent of the wave, and cross-infection occurred in two of the four. Nine cases were admitted during an inter-epidemic period, and six of these failed to give rise to cross-infection. The figures are small but highly suggestive.

It is clear that where it is possible to compare the curves of morbidity and mortality during a given epidemic the relation of these to each other will afford information bearing on this point. In certain cases where this has been done the crest of the morbidity curve has preceded, by a varying time-interval, the crest of the curve of mortality, and this is what we should expect from the considerations outlined above.

Virulence of Organisms.

If we inquire the cause of this loss of infectivity on the part of the virus one factor may be at once eliminated. The parasite does not cease to be infective because it is no longer virulent.

Those strains of *B. Danysz*, isolated during the course of the earlier experiments, which showed the greatest divergence as regards their ability to infect via the alimentary canal,

have been repeatedly tested as regards their virulence on intraperitoneal injection. The results have been remarkably uniform with the five strains tested. Intraperitoneal injection of 0·5 c.cm. and 0·25 c.cm. of a 24-hour broth culture has always been followed by death, usually within 24 hours. The majority of mice receiving 0·025 c.cm. have died within

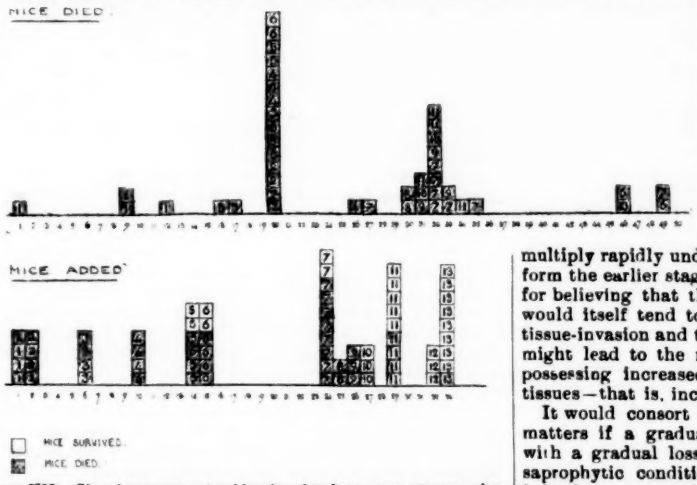


CHART VII.—Showing course of epidemic, of unknown cause, occurring in a large cage to which normal mice were added at irregular intervals.

48 hours. Mice receiving 0·0025 c.cm. or 0·00025 c.cm. have usually succumbed after a more prolonged interval (4–10 days). Mice injected with 0·000025 c.cm. and 0·0000025 c.cm. have never shown any ill-effects.

Thus a strain which failed to cause the death of a single mouse within 25 days of being administered with the food, and finally led to the death of one of six mice fed, always caused death in four days when 0·00025 c.cm. of a 24-hour broth culture was inoculated intraperitoneally.

Control tests, made with killed broth cultures to allow for the element of toxicity, sometimes produced late death (5–10 days) when 0·5 c.cm. of a killed culture was injected. Smaller quantities produced no apparent effect.

The question as to whether the especially infective strains were also more than usually virulent cannot be answered satisfactorily from the results of these tests. In some cases the virulence tests were not carried out for some time after the isolation of the strain. Although there was still a definite difference in the effects produced by feeding at the time when the virulence of the strains was tested, yet it was not so marked as at the time of isolation. The fact which emerges clearly is that an almost completely non-infective strain—that is, one which produces no illness when taken with the food—may be fully virulent when inoculated into the peritoneal cavity.

Cause of Loss of Infectivity.

To what, then, are we to ascribe the loss of infectivity on the part of the parasite? It must clearly be due to some deficiency which hinders it in its passage from host to host. Its power for multiplication in the tissues in general is not lessened. It seems at least possible that it is the power for multiplication elsewhere that is at fault.

Danysz, as noted above, has suggested that increased virulence for the tissues resulting from passage by subcutaneous injection or in some other way results in a loss of virulence in the alimentary canal. It is probable that in the spread of bacterial infection the parasite actually passes through successive phases of biological activity. It must live and multiply under very varying conditions. In an infected host it is living as a true tissue-parasite. If it be transferred to the naso-pharynx or to the alimentary canal of a fresh individual of the host-species, it must be able to accommodate itself to the new conditions. For in the absence of active multiplication it is highly unlikely that successful tissue invasion will be brought about. If the parasite is to be conveyed from host to host by a biting insect, then it must face the change in environment from the tissues and blood stream of the host to the alimentary canal of the insect carrier.

Indeed, it is probably the fact that during the spread of infection the parasite is subjected to a regular succession of environmental changes. Failure of accommodation at any stage may clearly prevent the infection of a fresh host. Now there is abundant evidence that adaptation to a new environment may be associated with a lessened ability to thrive under the old conditions. If the origin and rise of an epidemic wave do indeed depend on the factors which have been considered in the earlier part of these lectures, there seems to be an adequate reason for believing that continued variation of the parasite in the same direction would lead to the decline of the wave.

The Possible Course of the Process.

It was suggested that a saprophytic spread of the micro-organism concerned, associated with an increasing ability to multiply rapidly under the conditions locally existing, might form the earlier stages of the process. Reasons were given for believing that this increase in the rate of multiplication would itself tend to increase the probability of successful tissue-invasion and that successful transference to new hosts might lead to the natural selection of strains or varieties possessing increased powers of multiplication within the tissues—that is, increased virulence.

It would consort well with all our knowledge on such matters if a gradual increase in virulence were associated with a gradual loss of the ability to live under the earlier saprophytic conditions. We should thus have a loss of infectivity, unassociated with a loss of general virulence, the combination of biological attributes which the experimental results seem to require.

Whether or no bacterial parasites pass through developmental cycles, similar to those known to occur in other living organisms, is a question which has still to be answered. It would seem, however, that the essential phenomenon of an epidemic may be the progress of the virus through a cycle of selective variations which must be retraversed in each successive wave.

The accompanying diagram indicates roughly the possible course of such a process. The line indicating the variation in the rate of multiplication as a saprophyte must be taken to represent the degree of adaptation for life in the naso-pharynx or in the alimentary canal of the host or in the body of some insect carrier. It should almost certainly be represented not as one line but as a whole series of curves, corresponding to successive environmental changes. In the

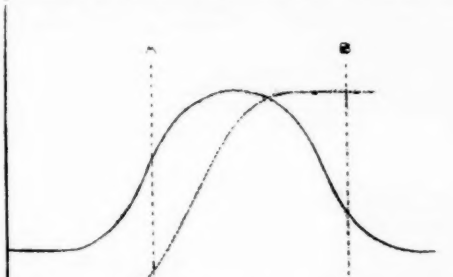


Diagram indicating possible explanation of the acquirement and loss by a bacterial virus of the property of infectivity during the course of an epidemic. The continuous line indicates rate of growth as saprophyte and the broken line rate of growth as "tissue-parasite" (virulence). A-B, period of "infectivity" and duration of epidemic.

same way the curve indicating variation in the rate of multiplication in the tissues represents the degree of adaptation for life under these very different conditions.

The increase in the rate of saprophytic growth is followed after a time by a gradual increase in the rate of parasitic growth in the strains successively evolved; but at some point in the rise of the latter curve, the curve of true virulence, there commences an associated fall in the curve representing the potentiality of saprophytic existence. It is during the period in which both these curves are at an abnormally high level that the parasite possesses infectivity, and it is during this same period that the epidemic occurs.

It has already been noted that, in an outbreak of cerebro-spinal fever, the carrier-rate begins to fall while the epidemic is at its height. Here, again, we have an indication of a loss of capacity for saprophytic growth in an increasingly virulent parasite preceding the decline of a wave of disease.

Capacity of Bacterial Parasites for Variation.

It might, perhaps, be supposed that the acceptance of such a view as this would involve the belief that any bacterial parasite, given the requisite environmental conditions, might give rise to epidemic disease. Neither clinical nor bacteriological experience would, however, lend any support to such a view. The constancy of the characteristic features of a given epidemic disease, when viewed as a whole, strongly indicates a uniform and specific virus. The results of countless attempts to increase the virulence of different bacteria have shown conclusively that while with some species this may be done with certainty, with others the most prolonged efforts in this direction have proved entirely fruitless.

It would seem that we are dealing with a more or less specific capacity for variation, analogous to the acquired capacity for bringing about certain fermentations, which has been studied by Penfold and others. As the result of certain environmental changes the bacterial parasite will vary in a particular direction, but the ability to react in this way must be regarded as something inherent in the organism itself.

THE SELECTIVE LOCALISATION OF BACTERIA.

Recent work on the selective localisation of bacterial parasites, and especially of members of the streptococcal group, has afforded evidence which has an important bearing on the point at issue.

Rosenow, in several communications, has dealt in detail with this matter. He has found that strains of streptococci, isolated from particular lesions in man, have tended to produce a high percentage of lesions in the same tissues or organs when inoculated intravenously into rabbits.

One example, which is of particular interest from the point of view of progressive adaptation to life in different tissues, may be referred to in more detail. Rosenow found that strains of streptococci isolated from cases of appendicitis, gastric ulcer, and cholecystitis resembled one another very closely in cultural and other ways. He found also that the general virulence was greater in strains isolated from gastric ulcer than in those isolated from appendicitis, and greater still in strains isolated from cholecystitis. The table shows the results he obtained by the intravenous inoculation of such strains at the time of isolation, after prolonged cultivation, and after passage.

Table showing Elective Localisation of Streptococci Obtained from Various Sources when First Isolated after Cultivation on Artificial Media and After Passage.

Nature of case from which streptococci were isolated.	No. of strains examined.	No. of animals inoculated.	Percentage of animals showing lesions of—				
			Appendix.	Stomach and duodenum.		Gall-bladder.	Pancreas.
				Hæmorrhage.	Ulcer.		
Appendicitis—			%	%	%	%	%
When isolated	14	68	68	6	1	1	0
Later	8	26	15	19	15	4	0
After passage	7	22	45	45	30	40	0
Ulcer of stomach—							
When isolated	18	103	3	60	60	20	3
Later	8	22	5	5	0	5	0
After passage	7	39	0	23	33	30	15
Cholecystitis—							
When isolated	12	41	0	39	15	80	5
Later	5	14	14	23	14	7	0
After passage	4	16	0	31	13	56	19

The above table is taken from the data given by Rosenow in a paper on "The Elective Localisation of Streptococci."

Some Significant Facts.

Several most significant facts can be observed. At the time of isolation the appendix strains seldom gave rise to lesions of the stomach or gall-bladder in the rabbits inoculated with them. After passage they caused a considerable percentage of lesions of these organs among the rabbits inoculated, while there was a slight decrease in the percentage of appendicular lesions produced.

The strains obtained from cases of ulcer of the stomach or duodenum, when first isolated, produced a high percentage of lesions of these organs, but very few lesions of the appendix. The relative number of gall-bladder lesions produced was considerably higher than with recently isolated strains from appendicitis. After artificial cultivation, when some loss of general virulence might be expected to have occurred, the proportion of appendicular lesions produced by the gastric and duodenal strains was slightly raised, but the proportion of lesions of the stomach, duodenum, and gall-bladder was considerably lowered. After passage the percentage of lesions in the appendix, stomach, and duodenum was less than at the time of isolation, but the proportion of rabbits showing gall-bladder lesions was raised.

Similarly the strains isolated from cases of cholecystitis caused no appendicular lesions, but a considerable proportion of lesions of the stomach and duodonum and a very high percentage of lesions of the gall-bladder. Artificial cultivation resulted in a loss of the power of affecting the gall-bladder, but an increase in the tendency to localisation in the appendix. Passage resulted in little change so far as these three organs were concerned.

The production of lesions of the pancreas by these strains is particularly interesting. No appendicular strain affected this organ. Three per cent. of the rabbits inoculated with strains from the stomach and duodenum showed pancreatic lesions. After artificial cultivation none did so. After passage 15 per cent. of rabbits showed lesions in this organ. With the gall-bladder strains lesions of the pancreas were produced in 5 per cent. of the rabbits inoculated with the cultures when first isolated. After artificial cultivation this property seemed to be entirely lost. After passage the proportion of pancreatic lesions was raised to 19 per cent.

Clinical observation, indeed, yields abundant evidence of the tendency for certain organisms to produce lesions in definite tissues. Moreover, the changes in type of a given disease during the course of an epidemic, and in successive epidemic waves, strongly suggests progressive adaptation on the part of the parasite to life in different tissues.

RESISTANCE OF THE HOST.

Though reasons have been given for believing that the outstanding feature in the subsidence of an epidemic is a loss of infectivity by the bacterial virus, yet the resistance of the host cannot be a negligible factor. It will operate by decreasing the concentration of susceptible individuals, and hence the chances of successful transference. It may clearly play an important part in contributing as an environmental factor to the progressive variation of the parasite.

There is no sufficient evidence as yet to enable us to form an opinion as to the exact way in which this factor of immunity, or the opposite condition of sensitisation, may affect the whole process. Probably they play a most important part, but the fact remains that the virus itself is ultimately altered in such a way that it can no longer infect normal individuals of the host-species, and this must be regarded as the essential point.

Similarly, the factor of bacterial symbiosis is probably of the highest importance, but here, again, we must wait for more exact knowledge.

VARIATION OF PARASITE DURING AN INDIVIDUAL ATTACK AND DURING COURSE OF EPIDEMIC.

It is of considerable interest to compare the changes in the biological characteristics of the parasite during a single attack of disease with the variations which occur during the whole course of an epidemic. The results recorded by Danysz, and the confirmatory evidence obtained in the present experiments, make it clear that strains of the bacillus isolated during the earlier stages of the disease, or before death, are far more likely to be infective to other mice than strains isolated after death—a fact which may probably be interpreted in the same way as the loss of infectivity during the decline of an epidemic.

There is a very general consensus of opinion that many infectious diseases exhibit their maximum infectivity during the earlier stages of an attack. Conradi has attempted to trace the period of infection, as regards the stage of disease in the infecting case, in 85 contact cases of typhoid fever.

According to the figures he obtained it appeared that 49 of these 85 secondary cases were infected during the first week of the primary case, 16 during the second week, and 10 during the third.

Klinger analysed 812 contact cases in a similar manner. He arrived at the conclusion that 33 of these cases were infected during the first week of the incubation period of the primary case, which was taken to be 14 days, while 150 were infected during the second week of this period. Thus, 183 secondary cases were the result of infection during a period when the patients forming the primary cases were not obviously ill, but when they must have been excreting the specific organism. The figures for contact cases traceable to infection during the first four weeks of the infecting case were 187, 158, 116, and 59 respectively. Klinger's figures thus corroborate those given by Conradi, with the additional suggestion of the importance of the incubation period from this point of view.

A very recent communication by Thomson, relating to cross-infection in a hospital ward in the case of chicken-pox, records observations which suggest that the contact infectivity of this disease undergoes a marked decrease about the end of the first week of the eruption.

Here again, then, clinical and epidemiological evidence supports, and is supported by, that obtained along bacteriological lines. It would seem that the cycle of variation passed through by the parasite during an isolated attack of disease is very similar to that traversed by the same bacterial virus during an epidemic wave.

THE INTER-EPIDEMIC PERIOD.

If this conception of the epidemic spread of bacterial infection be the true one, it may be inquired whether it throws any light on the long epidemic-free intervals in some cases, and the periodicity of the outbreaks in others. The subject is far too large and too complex to be considered here in any but the briefest and most tentative way; but certain consequences would arise from such a process which seem to offer a possible explanation of some of the phenomena observed.

The process, viewed from the standpoint of the bacterium, has been conceived as a progressive variation in the direction of adaptation to increasingly parasitic conditions of life. But the virulent variety evolved, so well adapted for its parasitic rôle, will have become so ill suited to life outside the body, and especially to life under those special conditions which have to be faced on the way to successful infection of a new host, that it will gradually die out from mere inability to secure for itself those environmental conditions which are necessary for its continued propagation.

Thus, at the end of such a cycle we should be left with scattered centres in which the virus was still existing in some earlier phase, but in order to produce a fresh wave of disease the whole of the latter part of the cycle must be passed through afresh. Now it has been seen already that the essential condition for such a process is a sufficient concentration of susceptible individuals, a factor whose importance in initiating epidemics has been emphasised by many epidemiologists, such as Farr, Davidson, and Hamer. This condition will clearly not exist if the epidemic has been a large one, for a considerable proportion of the population will have had conferred upon them an increased degree of resistance.

The length of the inter-epidemic period will depend on many factors: the extent of the epidemic, and hence the relative number of the population possessing heightened resistance; the natural persistence of such acquired immunity, which we know to vary with different diseases; and such factors as age susceptibility, which may involve long periods of time before a sufficient concentration of susceptibles is obtained for the start of another cycle of variation.

One fact must be emphasised. A degree of immunity quite insufficient to protect against a highly infective virus—that is to say, against an attack of the disease during an epidemic period—may well be sufficient to hinder or prevent those earlier transferences which form an essential part of the process.

If the inter-epidemic period be a long one the centres of increased prevalence of the specific virus will certainly have diminished in number and extent, and it may need special environmental conditions, such as the increased overcrowding and increased migration which war involves, to start the cycle again.

SECONDARY EPIDEMIC WAVES.

In a completely stationary population it would be difficult to fit the occurrence of secondary epidemic waves into such a conception as that here outlined. Under modern conditions, however, such stationary populations do not occur in big cities. If there be a steady influx of new individuals secondary waves are less difficult to account for. Fresh susceptibles arriving at the epidemic centre during the rise and crest of the wave will probably fall ready victims. As the wave subsides, however, these fresh arrivals will tend to escape, and they will be so diluted by the immune population that they will not form a soil suitably distributed for the start of a fresh cycle.

We may suppose that there will be a gradual reaccumulation of a susceptible population; but although this may reach a sufficient density to allow of the propagation of a second wave of disease, yet it will probably never equal that initially existing. Hence the rise of the wave will probably be less steep and sudden, and the crest flatter, than in the primary wave. These features actually occur, as has been pointed out by Greenwood and others, in the case of influenza.

Influenza.

In the case of this disease, at least, there is a definite increase in mortality during the secondary wave. It is possible that one factor contributing to this is the presence, scattered among the community, of strains of the virus which already possess in some degree those attributes which go to make up infectivity. If the new cycle of variation were to progress from this relatively advanced phase, and the spread of infection were to radiate from many scattered centres, it would seem probable that an unusually large proportion of highly virulent strains would make their appearance before the final phase was reached and before the loss of infectivity caused the subsidence of the wave.

The interval between the primary and secondary waves, and, indeed, the very occurrence of the latter, will depend on the rate of the influx of the fresh population—that is, largely on the ease of transit and the circumstances which may render migration abnormally great or small. There seems here a possible explanation of the variation observed in successive epidemics of influenza.

The solitary epidemic of 1847–48, the period 1889–94, with its four waves separated by relatively long intervals of time, and the present visitation, with the rapid sequence of primary and secondary waves, followed after another short interval by a third, correspond with the increase in the ease and rapidity of transit which has occurred during the same period, and hence with the rapidity with which a relatively susceptible population will tend to reaccumulate in an affected district. During the past months there have been many additional factors tending to an enormous increase in migration, leading to the same result.

THE CARRIER PROBLEM.

Assuming that the epidemic spread of bacterial infection follows the lines indicated above, we may inquire how far it may affect our conception of the rôle of the human carrier.

Temporary Carriers.

Carriers, as we have seen, may be divided into two fairly well-defined classes, according as they carry the specific organism concerned over short or prolonged periods. The latter type of carrier is in a very small minority and often exhibits peculiarities which appear to predispose to the carrier state.

The temporary carriers may again be subdivided according as they have or have not recently passed through an attack of the disease in question. Of these two varieties of temporary carriers we should seem to be justified in paying relatively slight regard to those individuals who have recently recovered from an attack, so far at least as they may be supposed to constitute important sources of immediate infection. Experimental and clinical evidence indicates that in such late stages of the disease the infectivity of the virus is at a minimum. The danger of these temporary carriers lies rather in the possibility that they may develop into the chronic variety.

Temporary carriers who have not passed through a recent attack would have to be regarded as manifestations of a general biological process leading up to an outbreak of disease.

Experience does not support any expectation that it would be possible to eliminate such carriers from the general population during the pre-epidemic stage by any method which would be practicable from an administrative point of view, save, perhaps, under special local conditions. The discovery of a rise in the carrier-rate of such an organism as the Meningococcus may, however, constitute a most useful warning of the imminence of an epidemic, and lead to the putting into force of those preventive measures whose efficacy has been proved.

Chronic Carriers.

The chronic carrier is a far more difficult problem. His importance as a possible centre for the spread of fresh infection has been abundantly demonstrated, in the case of typhoid fever at least. Whatever attempt may be made to minimise the part played by certain notorious carriers, it is difficult to believe that impartial judgment can give any other verdict on the whole facts. The case of "Typhoid Mary," of American fame, may leave room for doubt; but there are so many classical instances, including such convincing cases as that of the Folkestone milker, that the potential infectivity of carriers of this kind would seem to be clearly demonstrated.

There are two ways in which we might hope to prevent the harmful activities of such individuals. By rigorous bacteriological examination it might be possible to detect those persons who continue to carry the specific organism from the actual attack onwards. Such a scheme, however, presents difficulties so formidable as to exclude its actual enforcement. The control which it would be necessary to exercise over the movements of convalescent patients would hardly be submitted to. The possibilities of evasion by presenting false specimens for examination would be infinite in many cases. Moreover, the marked intermittency of the excretion of the specific organism suggests that no measure of control, short of repeated bacteriological examination lasting over many years, would avail to eliminate all these unfortunate individuals.

Our knowledge of the infectivity of the chronic carrier may, however, be utilised in another way, which offers far greater hope of useful results. If the possibility of this source of infection be constantly kept in mind in investigating epidemics of disease, then we may sometimes trace the trouble to its source, and by controlling the movements of the carrier prevent further infections occurring. The possibility of the control of the movements and activities of a proved chronic carrier is, of course, a purely legislative and administrative problem.

Consideration of the famous typhoid carriers strongly suggests that their occupation is a matter of primary importance. Nearly all have been in some way directly concerned in the handling of food and drink. Limitation in the direction of preventing them engaging in work of this kind would probably reduce their potential infectivity to a minimum.

Another fact seems worthy of notice. The chronic typhoid carrier does not seem, in most cases, to form the starting point of an epidemic spread of infection in the sense considered above. He seems rather to pass on to his victims, through the medium of food or drink, fully infective bacilli. Moreover, his activities in this direction are strikingly intermittent. It seems possible that the bacilli which he is harbouring in his alimentary canal or elsewhere are of a low degree of infectivity, but that at intervals some environmental change leads to variation in the direction of an increase of this attribute, and that it is under these circumstances that infection of other individuals occurs.

The experimental and the clinical results recorded, and especially those obtained by Rosenow, would suggest that it is not only in the spread of infection from case to case, but in the progressive involvement of different tissues in the same patient that variation in the biological activities of the parasite may form an essential factor. The progressive involvement of tissues in such a disease as tuberculosis might be largely explained on such a view.

THE POSSIBLE PREVENTION OF EPIDEMIC SPREAD OF INFECTION.

If only we had the requisite knowledge as regards the causative organisms of the more important infective diseases, and could establish a systematic survey of the bacterial flora of representative samples of the population, it would seem that we might obtain warning of the approach of an epidemic during the early stages of the process and before the actual commencement of the wave of disease. If this were possible there seems some ground for hope that something could be done to check the process in its earlier stages. In normal times, when considerations of public health are not overruled by still more urgent necessities, it should not be impossible so to alter the environmental conditions that serious obstacles would be placed in the way of the continued variation of the virus.

Information is needed on many points. The normal bacteriology of such an important locality as the nasopharynx is not known with any exactitude. Modern serological methods have placed at our disposal an instrument for the more exact differentiation of bacterial types which should prove of the greatest service in any such inquiry. If any work along such lines as these is to bear fruitful results, uniformity of technique among the observers engaged upon it is an essential factor. The work already carried out by the Medical Research Committee gives good ground for the belief that much that has proved impossible in the past will be attainable in the future.

The factors which tend to render the host-species more susceptible to attack, and especially the effect of such relatively simple matters as differences in temperature, atmospheric moisture, &c., are still very imperfectly understood. The observations of Leonard Hill offer an example of the valuable information which may be obtained by work along these lines.

The success of prophylactic inoculation in preventing the spread of epidemic infection has been amply demonstrated in certain diseases. Experience would suggest that it is in the prevention rather than in the treatment of disease that bacterial vaccines will find their permanent place. It seems possible that they may act largely by decreasing that concentration of susceptible individuals which is an essential factor during the earlier stages of the spread of infection. As pointed out above, a degree of resistance quite ineffective against a highly infective parasite might be of decisive importance at this stage.

Although the facts recorded above, when considered as a whole, would appear to be most satisfactorily explained along the lines indicated, the problem must be finally solved in the light of further evidence accumulated from all possible sources. It is only by the combined efforts of all workers in this field of biology that we are likely to acquire that knowledge which is so important for the prevention of disease.

The inquiry can clearly be extended on the experimental side. Further work along these and similar lines is being carried out in my own laboratory. There seems no reason why many of the conclusions arrived at through biometrical investigations should not be tested by experiments of this kind.

I should wish to record my indebtedness to Dr. Arkwright for supplying me with cultures and sera; and to Dr. Leiper and Professor Blackman for the benefit of their opinion on certain points. I am also indebted to Dr. S. G. Platts for much assistance during the earlier part of these investigations, and very especially to Mrs. Phyllis Worthington and to Dr. M. A. Omar for their constant help during many months.

Bibliography.—Brownlee: Trans. Roy. Soc. Med. (Epidem. Sec.), 1909, ii., 243. Conradi: Deutsch. Med. Woch., 1907, 1684. Danysz: Ann. de l'Inst. Pasteur, 1900, xiv., 193. Davidson: Quoted by Hamer, q.v. Farr: Vital Statistics, Lond., 1885. Greenwood: Brit. Med. Jour., 1918, ii., 563. Hamer: THE LANCET, 1906, i., 569, 655, 733. Leonard Hill: THE LANCET, 1913, i., 1285. Klinger: Arb. a. d. Kaiserl. Gesundh, 1909, xxx., 584. Penfold: Journ. Hyg., 1912, xii., 195. Rosenow: Journ. Amer. Med. Assoc., 1915, lxv., 1687, and many other papers. Thomson: THE LANCET, 1919, i., 397.

CORNWALL MEDICAL CHARITIES.—At the recent meeting of the Committee of the King Edward VII. Memorial Fund (Cornwall), which was held at Truro, the sum of £170 was allocated to various Cornish medical institutions.

SOMERSET COUNTY COUNCIL AND TUBERCULOSIS.—The Tuberculosis Subcommittee of the Somerset County Council recommended the purchase of 135 acres of land at Lincombe Hill, near Weston-super-Mare, for the provision of a permanent tuberculosis sanatorium, and this has been adopted by the council. The price of the land was £3250.

CEREBRO-SPINAL FEVER.

REMARKS ON ITS EPIDEMIOLOGY, PREVENTION, AND CLINICAL FEATURES.

BY J. DORGAN, M.B. R.U.I., D.P.H., D.T.M.,
LIEUTENANT-COLONEL, R.A.M.C.

THIS article is written to bring forward for criticism and inquiry a somewhat new aspect of the epidemiology and prevention and clinical features of cerebro-spinal fever. It is based on the investigation, by the writer and other officers, of an epidemic at a large X Garrison in March, 1916. A full report was submitted at the time to Surgeon-Colonel R. J. Reece, C.B., who with Lieutenant-Colonel M. H. Gordon, C.M.G., has controlled the investigation and preventive measures regarding this disease in the United Kingdom for the past four years. Further confirmatory facts have since been brought to the notice of these officers in official reports, letters, and verbal discussions.

The revised system of prophylaxis for 1918[1] has recently reached the writer in Mesopotamia. It is noted that the principal recommendations embody, without comment, the lines of prevention which were urged in the report of 1916, and which had been repeatedly pleaded for during the intervening two years.

Circumstances in which the Investigation was Carried Out.

The writer was employed in March, 1916, in coördinating the investigation and prevention of a large epidemic at X Garrison, having been detailed by the War Office, on the request of Colonel Reece for the services of a regular R.A.M.C. officer with special military sanitary experience. Further investigation was afterwards carried out at certain other stations, and in April, 1917, the writer had the advantage of further study at the Central Cerebro-spinal Fever Laboratory, whilst doing duty there for a short time.

The following officers were associated with the writer at X Garrison, Professor C. Samut, Temporary Captain, R.A.M.C., assisted by Captain Walter Scott, was responsible for the bacteriological investigation of the patients. His report at the time contained much that was original and interesting, and much of it has since been confirmed by other workers. Captains R. R. Armstrong and Napier were detached from the Central Cerebro-spinal Fever Laboratory. Their work was in connexion with the search for carriers. At the end of the epidemic Captain W. J. Tulloch continued their work on the carriers then in isolation. He was also detailed by Colonel Gordon from the Central Laboratory staff. Captains S. Trevor Davies and E. G. Pringle were specially selected to undertake the clinical charge of patients, and in their reports had given full details of the clinical aspects of the disease, with particular reference to atypical and irregular cases.

The report presented by the writer at the close of the epidemic included reports on the special subjects dealt with by the other officers. It is regretted that it was not possible to publish the full report at that time or later. Permission was obtained to publish an article in June, 1917, written on the same lines, but a hurried departure on active service left the arrangements incomplete. This is now written in mid-summer in Mesopotamia, under the disadvantage that the deductions of the 1918 season are unknown to the writer. Yet it is confidently believed that the views expressed in 1916 as a result of well-considered evidence, will be confirmed, rather than refuted, by the experience of yet another year.

The conclusions of the 1916 report were as follows:—I. The prevalence of atypical and unrecognised forms of cerebro-spinal fever. II. The prime importance of these atypical forms in the spread of the disease. III. There is no evidence at X Garrison to show that carriers convey active infection. The statistics as to carriers are conflicting and inconclusive, and their isolation is impracticable, irrational, and unjustifiable. IV. The infection in cerebro-spinal fever is not to be feared under good conditions of housing and ventilation. The early isolation of mild and severe cases, and the provision of free ventilation, compulsorily, and with sufficient warmth, during the time of seasonal prevalence, constitute the most effective means of prevention.

[1] R.A.M.C. Journal, January, 1918.

I. *The Prevalence of Atypical and Usually Unrecognised Forms of Cerebro spinal Fever.*

At an early stage of the epidemic attention became directed to the close relationship between patients definitely diagnosed cerebro-spinal fever and certain other patients suffering from indefinite febrile symptoms. The difference between the two forms of illness is in the degree and intensity rather than in the fundamental characters of the symptoms. As a rule, the symptoms of the indefinite illness were comparatively mild and commonplace, and such as, to an ordinary observer when taken individually and in the absence of an epidemic, would not necessarily suggest meningitis. Intense headache, more or less pain and stiffness of back and neck, vomiting, and insomnia were always complained of. The patient was apathetic and drowsy; he answered questions, but rarely enlarged on his symptoms, and evidently preferred to be left quiet and alone. On closer examination Kernig's sign was more or less positive; attempts to move the neck caused distinct pain, the pulse was slow, and other signs were often to be found denoting cerebral irritation. After a few days' fever the symptoms usually subsided, the patient was left prostrate, and convalescence was slow. Relapses were liable to occur, which sometimes assumed the characteristic form of cerebro-spinal fever.

At times an acute and fatal illness was associated with the proved cases, the symptoms of which were more or less obscure when critically examined. Such patients were often brought to hospital in a drowsy or delirious condition. A very acute and œdematous form of bronchitis or broncho-pneumonia often quickly supervened, and death occurred rapidly with signs of septic intoxication. Various symptomatic diagnoses were made of such cases, and the cause of death was variously given—influenza, bronchitis, broncho-pneumonia, asthma, pneumonia, being the most common diseases registered.

It was decided, therefore, to test such obscure cases found in association with the genuine disease. Meningococci were found in the spinal fluids of many patients whose symptoms would not have ordinarily suggested meningitis. We had reasons, moreover, for believing that many of our negative results were due to the failure of modern technique to demonstrate the meningococcus.

Suspicion was at first aroused as to a relationship between the above types of illness, not only by the similarity of the symptoms, but also by the manner in which they were found associated in billets, tents, barrack rooms, and regiments. It is impossible to give details of the numerous instances investigated by the writer where the evidence definitely pointed to the conclusion that both conditions were but variations of a single disease.

Convenient illustrations of atypical and unrecognised cases are, however, given on p. 58 of the Medical Research Committee's Report, Series 3. Captain M. Flack, of the Central Cerebro-spinal Fever Laboratory, has, however, mentioned them here as his examples of infection by carriers. This point will be discussed later.

Some Circumstantial Evidence.

In the first family the father, a soldier, was definitely ill, with headache and pain in the back, on his arrival home on leave. Two days afterwards one of his children was taken to a general hospital with symptoms of cerebro-spinal fever. Next day another child was taken to an isolation hospital and died of cerebro-spinal fever. The first child was discharged from the general hospital in a few days, the symptoms having aborted, being brought home by an elder sister on a Thursday. The latter died of fulminating cerebro-spinal fever which developed on the Sunday following, she having evidently been infected by the unrecognised disease in the younger member of the family.

In the second family a child was taken ill and died next day of cerebro-spinal fever. Three other children were taken ill with fever. One of them who had no marked meningitis symptoms, and in whom the blood and spinal fluid were apparently sterile, yet was subsequently accidentally found to have suffered from cerebro-spinal fever by the finding of the meningococcus in the fluid of a swollen knee-joint. The diagnosis of the other two children is, however, not given. All three are known to have been treated in the isolation hospital.

The following story was told to the writer by a soldier who came to be swabbed at the Central Cerebro-spinal Fever

Laboratory. He recently had suffered from a severe attack of so-called influenza whilst with his regiment. He was, however, only detained in hospital for three days and then got week-end leave home. He described his illness as being very severe and as "absolutely flattening him out." He suffered from headache, backache, and vomiting. Three days after his arrival home, his child developed cerebro-spinal fever, and on the following day his wife took very ill with influenza. He believed he caused her illness, her symptoms being very much the same as his own, although she was confined to bed for 14 days, attended by a doctor. His unit was infected with cerebro-spinal fever; there were no others in the family and they had little outside communication with other persons, and he proved not to be a carrier.

Statistical Data.

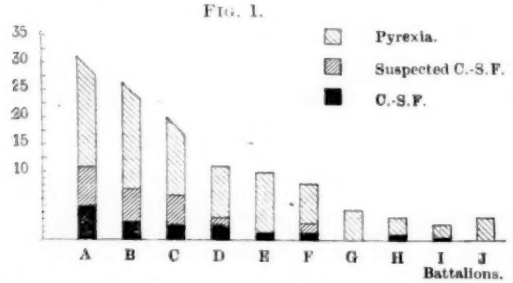
Instead of further repetition of suchlike circumstantial evidence, which came to our notice at X and other garrisons, it is proposed to argue the relationship, from statistics and facts showing the proportionate incidence of cerebro-spinal fever and possibly unrecognised forms of the same disease, in various units and stations. These statistics show that in connexion with each outbreak there is a coincident and proportionate outburst of cases of pyrexia of uncertain origin, the symptoms of which are compatible with those found in cerebro-spinal fever.

In *O Block barrack building at X Garrison* there were nine diagnosed cases of cerebro-spinal fever (three fatal) in March, 1916. About 120 men occupied the six rooms and comprised a half company. In addition, there were 18 other men admitted to hospital during the month suffering from febrile symptoms. Three of these also died, four others were punctured, having definite meningitic symptoms. Three others were mentioned as having been swabbed as a preliminary to puncture, and in fact, in the light of after knowledge, they all might have been cases of cerebro-spinal fever There were 13 cases of cerebro-spinal fever in this battalion as compared with nine in this half company, and the latter's admissions for indefinite pyrexias were likewise disproportionate to the admissions for such illness for the rest of the battalion.

The writer had an opportunity of studying an outbreak which had just concluded at *H Garrison* in 1916. Twenty cases had been recorded. The question whether there had been unrecognised cases was the special subject of inquiry at this station. The medical officers reported a very severe outbreak of influenzal illness, chiefly localised in certain units. Many obscure deaths had occurred. The nursing sisters' report books at the Central Hospital were examined by the writer, and in this way a fairly accurate clinical picture was obtained of the symptoms of the patients. Case-sheets were available in certain cases. The names of 40 persons were thus selected as being possibly cases of cerebro-spinal fever, the symptoms being more or less suggestive.

When the names were afterwards allocated to their units the result was remarkable, and is given below in graphic form. (Fig. 1.) It shows that the units chiefly infected

FIG. 1.



with cerebro-spinal fever were infected proportionately with an illness, the symptoms of which were in close accord with the symptoms of the definite disease. Certain units were free from both forms of illness. The 40 names were selected as most suspicious from amongst the names of some hundreds of admissions during the same period. The chief symptoms which influenced the selection of these names were—severity of headache, backache, rigidity, vomiting, and delirium. The rapid death of an otherwise healthy soldier, without definite cause, was in itself a sufficient reason for suspicion in certain fatal cases. In others, the prolongation and irregularity of the fever, with relapses and slow convalescence, seemed more in accordance with the signs of meningococcal infection than with any other definite known disease. In many of these the possibility of cerebro-spinal fever was mentioned, and sometimes lumbar puncture was performed with negative results.

From the proportionate incidence of proved cases of cerebro-spinal fever and probable and possible cases, the inference is justified that at this station the disease was more widespread than indicated by the reported cases.

At *D Garrison* there were 21 cases with 10 deaths. Twelve of the cases occurred in one battalion, the strength of which was one-ninth part of the strength of the whole garrison. All the cases occurred between March 15th and April 6th. The infection was imported by a draft which arrived on March 10th. In addition to the 12 cases of cerebro-spinal fever in this unit, there were 12 other persons who died from various febrile conditions amongst patients admitted during the above infective period, the symptoms again being compatible with cerebro-spinal fever. The remaining eight-ninths of the garrison had only four such deaths from febrile diseases. This extraordinarily high death rate in this battalion during the infective period is most remarkable, especially as the unit was at other times healthy, and for the periods of six weeks before and after this period it had only 1 febrile death out of 24 for the rest of the garrison. Again, there were 18 patients punctured at this station with negative results; of these, 12 belonged to the highly infected battalion, and 4 of these 12 died.

It seems undoubted, therefore, that in this battalion many persons died of cerebro-spinal fever in addition to those returned as such, and that many of those suspected cases which were punctured but which failed to receive bacteriological confirmation were in reality suffering from the disease.

At *X Depôt* there were 20 cases, variously distributed amongst four out of the five regiments stationed there. The medical officer in charge informed the writer that there were large numbers suffering from a severe type of influenzal disease in the hospital about the same time, many of which had symptoms which approximated to those of cerebro-spinal fever. He kindly collected for me the numbers of such patients admitted per 1000 of strength. This, with the case-incidence, is given below for each regiment, and it is noticed that they are in correspondence. (The carrier percentage is, however, in the reverse ratio of the cases.)

Units	A	B	C	D	E
Cases C.-S.F.	7	7	4	2	0
Uncertain pyrexia per 1000 ...	117	92	42	28	20
Carrier percentage	22	30	24	42	36

Causes of Non-recognition of Cases.

Many cases of cerebro-spinal fever escape recognition because: (*a*) they are not suspected clinically; (*b*) they fail to be tested by lumbar puncture; (*c*) modern bacteriological methods frequently fail to demonstrate meningococci, particularly in early and irregular cases.

(*a*) *Many cases are not suspected clinically*, as mentioned, when taken individually, and in the absence of an epidemic. The laboratory at X Garrison dealt with a large area of country, in addition to the garrison, which was under our immediate observation. All the patients whom we investigated were either of the acute fulminating type or else had been ill for several days or weeks before the possibility of cerebro-spinal fever arose. Whilst working at the Central Laboratory in May, 1917, the writer visited with Captain Glover seven definitely proved cases of cerebro-spinal fever. Four of these had been for long periods under observation in well-known London hospitals before an appeal was made to the Central Laboratory. Two of them had been invalided from France as unrecognised cases.

(*b*) *Many suspected cases fail to be tested by lumbar puncture.* Often facilities for puncture are not immediately available. Lumbar puncture is regarded by many as a serious operation, and as such is only performed when the symptoms are most definite and persistent. It often happens that symptoms, which are at first characteristic, subside rapidly, and before time has been found to perform lumbar puncture the whole clinical picture has altered and puncture is not performed.

Numerous instances occurred at the stations investigated by the writer, where it was mentioned in the notes of the irregular type of patients that the question of performing lumbar puncture was considered, but for one reason or another it was not performed. The failure to puncture must occur much more frequently in civil practice and in sporadic cases, where each patient is not under particular observation.

It may be here mentioned that at X Garrison in 1916 and 1917 there were 1000 lumbar punctures performed by Captains Trevor Davies, Pringle, and Scott. There were no untoward results. The benefit to the patient from lumbar puncture alone is undoubted. No definite opinion was formed as to the benefit or otherwise of serum. A group of patients, to whom no serum was given, did equally well with those to whom it had been given. There appeared to be no definite and regular reactionary improvement, such as one should expect after a specific serum. All varieties, as supplied by Colonel Gordon, were tried. The more the existence of mild and abortive types of the disease is recognised the less will be the tendency necessarily to attribute beneficial results to the serum administered.

Bacteriological Diagnosis.

(*c*) *Many cases fail to receive a true diagnosis owing to the frequent failure of modern bacteriological technique.* In all the diagnosed cases (150) at X Garrison in 1916 a Gram-negative intracellular diplococcus was seen in the spinal fluid. In more than half of the cases it was grown in culture and agglutinated. Twenty-one cultures were submitted to Colonel Gordon at the Central Laboratory and he agglutinated 18 of these to his types, 3 others being contaminated. The following table gives the numbers of examinations made of spinal fluids throughout the epidemic at X Garrison and also the results:—

—	No. examined.	No. negative.	Percentage negative.	—	No. examined.	No. negative.	Percentage negative.
Week ending—				Week ending—			
March 11 ...	19	1	5	April 15 ...	26	9	34
,, 18 ...	25	2	8	,, 22 ...	13	9	69
,, 25 ...	11	1	9	,, 29 ...	23	12	52
April 1 ...	23	3	13	May 6 ...	8	4	50
,, 8 ...	24	7	29	Total ...	172	48	27%

The special study of atypical cases began early in April. It caused an increase in the negative results. During the last three weeks the percentage of negative returns increased greatly. During this last period a positive bacteriological result was only recorded when the organism was grown on culture. This was in accordance with instructions received from Colonel Gordon. There was no doubt that during this period many of these cases, returned as negative, were actually suffering from cerebro-spinal fever. The symptoms in many cases were open to no doubt, and one intracellular organism, identical with the meningococcus, was seen in the spinal fluid.

Captain Samut, in his report of 1916, had shown the increasing difficulty of demonstrating meningococci in the fluid from early and milder cases where the fluid is clear. The difficulty of obtaining a culture increases under like conditions. Sometimes, however, an abundant growth was obtained on culture of fluids in which the meningococcus could not be seen, and, on the other hand, a purulent fluid, in which meningococci could be seen in abundance, sometimes failed to give a growth.

At X Garrison at this time we were making a study of irregular types at the earliest possible moment after the onset of symptoms, and a large number of negative results were to be expected, and were it not for Captain Samut's painstaking researches it is believed our negative results would have been still higher.

It was sometimes found that patients suffering from meningitic symptoms gave an apparently sterile fluid on first puncture, yet on repeating the operation at a later date meningococci were abundantly present. Captain Scott in 1917 showed the writer a patient at X Garrison; clinically, the symptoms left the diagnosis in no doubt, yet it was not until the fourth puncture that meningococci could be found.

It would appear, therefore, that neither the failure to find organisms on direct examination, nor a negative cultural result, can be relied upon to exclude a diagnosis of cerebro-spinal fever. In the second family mentioned above a child whose blood and spinal fluid were both (apparently) sterile was afterwards diagnosed by finding the meningococcus in a synovial fluid.

Other writers have noticed the weak points of bacteriology in the diagnosis of this disease. Worster-Drought [2] said that "bacteriological results are apt to be misleading, if relied upon, as clinical symptoms are often well advanced before organisms can be either seen or grown." Gaskell found fluids sterile at one puncture and positive at the next, and 6 out of 25 clinically definite cases failed to show the meningococcus. In the R.N. Reports of 1915–16, it is stated that "at Shotley, there were 11 cases bacteriologically diagnosed, and there were 11 others in which lumbar puncture was performed with negative results. Some of the latter suffered from severe and persistent headache at the time, and in some, paralysis and mental derangement followed."

II. *The Prime Importance of Unrecognised Cases in the Spread of the Infection.*

It would appear that indefinite cases, which often pass unrecognised, are in reality the more numerous, and that comparatively few progress to the stage where the symptoms are unmistakable. The indefinite cases are usually found associated with others of the usually accepted types, and between the two extremes are intermediates of all stages of severity.

The apparently sporadic occurrence of the majority of cases of this disease has often been commented upon. Two or more adult patients are not often found, associated in infection, and possessing all the classical signs of cerebro-spinal fever. Yet in our experience at X and other stations, it has nearly always been possible to trace a connexion between such definite cases, and others who have suffered from a form of pyrexia of uncertain origin. This connexion is chiefly noticed where the conditions as to housing and ventilation are unsatisfactory. In children, however, it is far from uncommon to find one or more unequivocal cases amongst the other children exposed to the infection. This frequency of multiple infection in children may be explained by the intense susceptibility of those of tender age to reflex irritation of the central nervous system, so that even a slight disturbance more often provokes in them characteristic cerebral phenomena, and cerebro-spinal fever is generally recognised as a disease of childhood. The meningeal scream and convulsion of a child cannot but suggest meningitis, whereas the headache, backache, fever, and vomiting of an adult may frequently fail to do so.

The diagnosis of cerebro-spinal fever is therefore probably more frequently and accurately made in children, and this largely serves to explain the greater infectivity and the higher incidence of the disease as reported amongst them. In adults, on the other hand, the variability of the symptoms frequently tends to the non-recognition of many cases and to the consequent failure in tracing the infective connexion between different forms of the same disease.

Variation in Resulting Infection.

The effects produced by a given dose of meningococci depends on the susceptibility of the patient rather than on the virulence of the organism, because the infection received from an acutely severe case may result only in a mild and indefinite illness in the person next infected, and, on the other hand, a patient with a mild illness may reproduce a most virulent infection in another.

This mutation in the type of resulting infection is well illustrated in the two families already mentioned. In the first family the first child, whose symptoms were so mild that the disease was unrecognised, infected its eldest sister with fulminating cerebro-spinal fever. In the second family an acutely fatal disease resulted in three other children being variously attacked, one of whom was proved to be suffering from cerebro-spinal fever, although it had no marked meningitic symptoms, and the cerebro-spinal fluid was apparently sterile and uninvolved.

Though as a rule the onset of cerebro-spinal fever is sudden and definite, yet a considerable number of patients develop the disease insidiously. A close study was made of the

[2] Brit. Med. Jour., Nov. 18th, 1916.

interval between onset of symptoms and admission to hospital in 45 consecutive cases at X Garrison; it was found to average 50 hours. During this time they were treated as extern patients, and must have constituted a virulent focus of infection to their comrades in barracks. The fact that unrecognised and irregular types tend to be more insidious in their onset than the definite and fulminating forms causes the former to be a much greater danger than the latter in the spread of the disease.

As already stated, the possibility of irregular and unrecognised forms of cerebro-spinal fever was first suspected by the writer by the undoubted association between proved cases and certain other febrile conditions, which differed in the intensity rather than in the essential characters of the symptoms. Very many individual instances could be given of a similar nature to the three families mentioned above. The evidence in these cases, though circumstantial, yet was so often repeated, and of such a conclusive nature when investigated on the spot, that it perforce led to no other conclusion than that such variation of symptoms as existed were due to the susceptibility of the patient and not to any difference in the common infecting organism.

Again, the simultaneous outbreaks of vague febrile diseases occurring in constant connexion with epidemics of cerebro-spinal fever, and the exactly proportionate incidence of both illnesses in various units and garrisons, as pointed out above, cannot be due to the chance incidence of two separate outbreaks in all of the units concerned, and the inference is again more than justified that a single organism is responsible for both types of illnesses.

The occurrence of these indefinite febrile outbreaks has been constantly noted by all observers. Dr. W. H. Hamer, medical officer of health of the London County Council, has given most interesting evidence of the association between them and epidemics of cerebro-spinal fever. In the Royal Naval Reports for 1914–16 the frequency with which unrecognised or aborted cases occurred amongst contacts of actual cases is discussed. Dr. Bruce Low, commenting on an outbreak at Northampton several years ago, wrote as follows:—

"There were also in this instance, coincidently with the 30 unequivocal cases, several others of an anomalous sort, mostly amongst persons who had been in contact with one or other of the patients who had been seriously ill; these cases resembled influenza and all recovered. ..... This is the more interesting from the fact that the serious cases and those with only influenza-like symptoms occurred side by side."

III. *Carriers.*

There is no evidence at X Garrison to show that carriers convey active infection. The statistics as to carriers are conflicting and inconclusive. Their isolation is impracticable and unjustifiable.

At X Garrison 520 carriers were isolated for varying periods up to four months. 187 carriers had been detected amongst the contacts of cases and 333 from the general body of troops examined when leaving the station on active service or otherwise. Captains Armstrong and Napier had isolated most of these on the result of morphological appearances because time did not permit of serological tests of the greater number of swabs. At the close of the epidemic Captain W. J. Tulloch was deputed by Colonel Gordon to complete the examination of the 324 men then remaining in isolation. This officer found that 103 of these were not infected with an agglutinable organism, consequently, as Colonel Gordon mentions, "persons harbouring such non-agglutinable meningococci should not be regarded as, or treated as, carriers of the organism."

Of the original 520 persons in isolation there were therefore at least 150 men who were not carriers at all. If carriers are capable of carrying infection it seems extraordinary that each of these soldiers escaped infection when surrounded by 400 virulent carriers. They lived together for weeks and months in the hospital enclosure under somewhat unsatisfactory conditions.

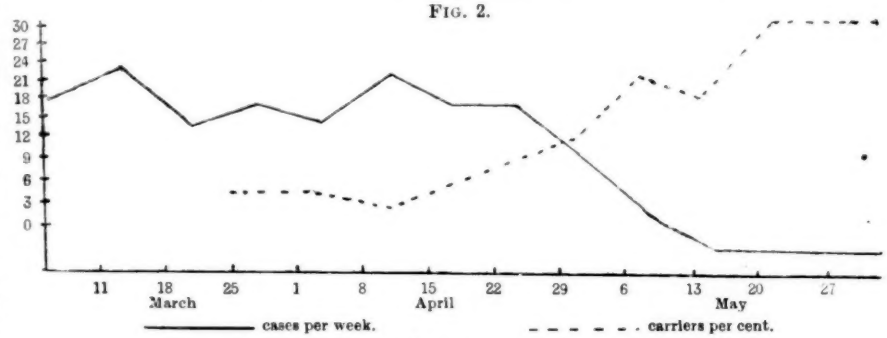
Neither did any of the 400 active carriers develop the disease, nor any of the 504 known carriers isolated by the Central Cerebro-spinal Fever Laboratory as a result of the swabbing at X Depôt in the following year. Colonel Gordon says, "Only occasionally does the meningococcus succeed in passing the barrier of the mucous membrane of the naso-pharynx and penetrating to the meninges." Surely it ought to have succeeded in some of these 1000 men.

It is well known that carriers practically never develop the disease. So much so that it has been suggested that they acquire an immunity. This is negatived at X Garrison, because one known carrier contracted the disease whilst employed as a nurse in the cerebro-spinal wards. He lived apart, and evidently got infected from his patients. Another ex-carrier got the disease three weeks after his discharge from the isolation camp, after three negative swabs. Of course, immunity does not explain why none of the 150 false carriers failed to become infected.

The Carrier Hypothesis.

At X Garrison 14,000 men were examined to find the carriers as above. About 200 per day were tested. These numbers constitute a record for an epidemic, and they are sufficiently large to give a fair index of the daily carrier-rate throughout the course of the epidemic. As seen from the chart (Fig. 2), the carrier-rate at the period of maximum incidence was low, but as the cases ceased to occur the percentage rose to a high figure (33 per cent.). These figures show that a low carrier index may coincide with a high case incidence, and vice versa, and might be taken to indicate that cases produce carriers, but not carriers cases.

FIG. 2.



The principal argument in favour of the carrier hypothesis has been the frequent discovery of a carrier amongst the contacts after the diagnosis of a case. The above-mentioned two families are the two instances of "evidence" of infection of cases by carriers as brought forward by Captain Flack. In the first family the father had been definitely ill on arrival home, and his children took ill two and three days after his arrival, and in the other family the father had been 10 days at home before his four children took ill, which would seem to indicate that the latter was in no way concerned with the infection of his children. Both of the fathers were found to be carriers after the illness. In the third family mentioned by the writer the father apparently infected his child with cerebro-spinal fever and wife with "influenza," but in his case he was not a carrier.

Carriers are found in all communities in larger or smaller numbers. In order to establish a case in favour of the carrier having caused the case, it is necessary to prove that the carrier, found as a contact, is actively pathogenic and different from the numerous other carriers universally present, or, that the proportion of carriers found amongst non-contacts is comparatively small compared with the numbers found amongst actual contacts of the patients. No one has, however, attempted to show a difference between pathogenic and non-pathogenic carriers. Neither have any statistics been produced to show a difference in the percentage of carriers among contacts and non-contact carrier groups.

Some Statistics in regard to Carriers.

At X Depôt, which has been the test station for the officers of the Central Cerebro-spinal Fever Laboratory, it was shown that no more carriers are to be expected amongst contacts than amongst those persons in no way connected with the patients—there being 34 per cent. in each case at this station. At X Garrison our own experience was the same, there being the same number of carriers amongst the population generally as there were amongst those persons in close contact with the patient.

Whilst working at the Central Laboratory in 1917 Captain Tulloch kindly allowed the writer to examine his series of results of examination of type in the naso-pharynx of carriers found in connexion with definite cases of cerebro-spinal fever. He agreed that there was no undue prevalence of the type as found on spinal puncture and that found in the naso-pharynx of the carriers. Such a prevalence would be expected if a relationship existed as regards infection between case and carrier.

At X Garrison there were no carriers found in connexion with 45 of the 150 cases in this epidemic, 250 persons having been examined as contacts of these cases. They were well chosen, being chiefly those occupying the same tent, billet, or barrack room as the patient. This is rather remarkable, as the carrier-rate generally, as shown above, was high.

Three soldiers at X Garrison were negative in their naso-pharynx within 24 hours of the onset of the acute symptoms of cerebro-spinal fever; two others were negative 48 hours and two 72 hours before the onset (and two more were likewise negative within 72 hours of being taken ill). These men happened to be swabbed as contacts immediately after the diagnosis of a previous case.

Captains Armstrong and Napier examined, at the writer's request, the throats of 41 cerebro-spinal fever patients on admission to hospital. In 19 only was the meningococcus shown to be present. Captain Glover repeated the same test in the following year, also at the writer's request, in 4 proved cases we visited together, and in only one of these was the meningococcus found in the naso-pharynx. The swabs were taken and the cultures examined with especial care.

Route of Infection.

Many patients consequently who develop cerebro-spinal fever are apparently not infected by the meningococcus in their naso-pharynx either at the onset of the symptoms or within the period immediately preceding the onset. It would seem, therefore, that such patients have not received, nor are they likely to convey, infection via the naso-pharynx.

Colonel Gordon, with whom the writer has discussed the above findings, makes no comment on this work of officers from his own laboratory when he says that "the meningococcus is invariably to be found in the naso-pharyngeal secretion at the onset of the disease. ..... Only occasionally does the meningococcus succeed in passing the barrier of the mucous membrane of the naso-pharynx and penetrating to the meninges."

The opinions of many other observers are directly contradictory to these views. Surgeon-General Rolleston, in his account of Cerebro-spinal Fever in the Navy,[3] says that "During the acute stage of cerebro-spinal fever swabs from the naso-pharynx are often negative. Out of 33 cases, bacteriologically proved, meningococci were found in 7, or 21 per cent. only." These results are in agreement with von Lingelsheim's figures of 635 cases of cerebro-spinal fever with 146, or 22 per cent. of positive cultivations, from the naso-pharynx, and with those of Gaskell and Foster, who likewise found that only 25 per cent. of their cases were infected in their naso-pharynx. Netter's results show that only 60 per cent. are infected. In the Special Advisory Committee's report it is mentioned that "the meningococcus has been much less commonly found in the naso-pharynx of actual sufferers than might have been expected."

Recent work has thrown considerable doubt on the long-established belief that meningococci pass direct through the nasal mucous to the meninges. In many cases, certainly, the blood is infected prior to the cerebro-spinal fluid, which apparently often remains free of infection throughout, as in the case of the child already mentioned. It is more in accordance with modern ideas that the transmission should be via the blood.

[3] THE LANCET, Jan. 13th, 1917.

Types of Organism.

The chief argument in support of the carrier theory given by Colonel Gordon is that he invariably finds the naso-pharynx infected by the same type of organism as is found in the spinal fluid. This evidence is already disproved, as above, by his own staff and others, who more often than not failed to find the meningococcus in the naso-pharynx. He believes that four types of meningococci exist, which are specifically distinct "and not transient and unstable variants of a single micro-organism." Again, other workers are unable to agree with him in this. Walker Hall and others find that the types are subject to mutation on culture. Bassett-Smith found that of 107 carriers who had more than one positive examination, more than half of them showed a variation of the Gordon type on subsequent swabbings. Eastwood, Griffiths, and Scott believe that the distinction between types is arbitrary and depends on the chance selection of strains.

Colonel Gordon has recently[4] replied to the contradictory observations (by other workers) with regard to his classification of meningococci. He explains their results as follows:—

"The research is of a distinctly arduous character—demanding a very high degree of dexterity that can only be acquired by continuous and persevering effort—even minute errors may mar or upset the result. In our experience at the Central Laboratory it requires at least six weeks' hard work before even a trained bacteriologist, with considerable serological experience, can sufficiently master the technique to obtain consistently satisfactory results. Similarly, when he goes on a holiday, even for a week, it requires at least another week's work before the necessary unconscious manipulative dexterity returns. After that degree of dexterity is reached irregular results are far less frequent than before."

It would seem as if the technique is so far above the ordinary well-trained bacteriologist that it loses much of its practical value.

Two, three, or four of these specifically distinct organisms are present in most epidemics. This seems very incredible from an epidemiological point of view. It is comparable to finding para. A and B and typhosus bacilli, irregularly, in the investigation of a definitely localised epidemic of typhoid fever. It would mean that each outburst of cerebro-spinal fever is due to two, three, or four distinct organisms being simultaneously let loose to produce infection. This seems so unlikely that it causes us again to hesitate before accepting the view that four specifically distinct organisms are concerned in epidemics of cerebro-spinal fever.

The Isolation of Carriers.

The prophylaxis for 1918, as approved by Colonel Gordon, is given.[5] The sixth and last recommendation is "that large sample swabbings (100 men) be taken weekly as a guide to the current carrier-rate." It is understood that case-contacts were to be swabbed as before, and that carriers from both sources were isolated. Such a proposal appears unsound and unjustifiable if it has involved the loss of man-power by isolation of carriers, as in former years. It can only be hoped to discover a small proportion of carriers by this procedure, for as, ordinarily, samples represent but a small fraction of the whole population so therefore the carriers found in sample groups represent the same fraction of the total number of persons carrying.

The practical effect of such a scheme was illustrated at X Garrison in 1916. At the close of the epidemic there the writer reported as follows:—

"It was decided to stop the further swabbing of drafts and to discharge the carriers then in isolation, further cases having ceased to occur. It seemed no longer logical to detain in strict isolation 400 men when recent swabbing results indicated that there were at least 5000 carriers living at large amongst the troops."

The discharge of the carriers was, however, countermanded by Colonel Reece and the further history is given by Captain Tulloch in the Medical Research Committee's Report, Series 3, but 60 of them had actually been discharged without ill-effects.

Again, at X Depôt, which had been under the continual observation of the officers of the Central Laboratory for two years, it was known that during the epidemic half of the population (5500) were carrying, yet at the same time about 200 healthy men were detained as carriers in hospital.

[4] R.A.M.C. Journal, January, 1918. [5] Ibid., p. 35.

At X Garrison and at X Depôt the samples were taken on a record scale, 17,500 men having been swabbed and over a thousand carriers isolated, yet at no one time did the carriers amount to one-twelfth part of the total number of carriers available. The population in both was largely a floating one.

There is no reason why case carriers should be isolated any more than carriers from sample. At the above depôt the carrier-rate amongst the two groups was exactly the same (34 per cent.), and, as previously stated, no one has ever suggested that the carrier found in connexion with a case differs in any way as regards infection.

The possibility of failure in detecting a carrier would appear to be at least 20 per cent., judging by the writer's examination of the results of repeated swabbings of chronic carriers, where intermittent negative results were followed by positive findings. Fildes and Wallis [6] report:—

"If two consecutive negative swabs (the Navy require six) are taken as the index of cure, no less than 36 per cent. of men will, in fact, not be cured and will be returned to the community in the same condition as they were before they were isolated." And they concluded as follows: "One-third of the men recover spontaneously. None of the methods of treatment tested has any conspicuous merit, nor has any one obvious advantage over another."

It seems most irrational, therefore, to elaborate an extensive system of control which fails in detecting infection in nearly a quarter of the cases examined and which permits more than a third of the infected persons to be discharged uncured, and which detains healthy men for a treatment which possesses no obvious merit. Moreover, the isolation of case and sample carriers can never hope to deal with more than one-twelfth of the total numbers of carriers in a community.

Methods of Treatment of Carriers.

The impracticability of former methods of preventive control by isolation of carriers has now evidently become apparent (vide Colonels Reece and Gordon). It is recently admitted that "when the carrier-rate is high this procedure loses its value," and consequently a new procedure has been adopted—"inhaling-room treatment, which offers valuable help at any point where isolation breaks down." This treatment is still in an experimental stage, and up to the commencement of 1918 no tangible evidence was produced of its value. It would seem to be a tactical measure, which serves to focus the attention on a healthy carrier, and covers the retirement from the former position which had become untenable.

Various types of inhalers have been already tried—the Lingner-Gordon, Falmouth, and Levick. The last type, which was issued in large numbers in 1917, appears to have been replaced by the Hine pattern in 1918, the advantage of which is that "the atmosphere is not vitiated by the fumes of the burning spirit, as with the Levick spray." Many disinfectants have likewise been tried. The results from chloramine appeared to have been considered the best:—

"Though still somewhat few in number, they are more than encouraging, chloramine having given better results than any other antiseptic yet tried in this way." Yet the next year at the X Depôt it was mentioned that "as the treatment was new it was considered advisable in this instance to begin with zinc sulphate, because it is less irritating than chloramine." Yet the previous year Colonel Gordon reported that "the results with zinc salts were disappointing, but they served to emphasise the success of those obtained with chloramine. Only one known carrier could be subjected to the zinc spray—this carrier required no less than 70 inhalations before he could be discharged."

The above extracts from published reports of Colonel Gordon and the officers of the Central Cerebro-spinal Fever Laboratory are given to show on what little evidence these officers have submitted to the public this new form of treatment.

Fildes and Wallis included chloramine in their tests as to the value of local antiseptic in the treatment of carriers, and their opinion has been given above of the value of this and other forms of nasal disinfection.

The writer has not had much definite personal knowledge of the value of the treatment. The published results are few and without statistical value. It has been claimed that it is equally effective in reducing the incidence of measles, sore-throats, &c. The writer noted, however, that at D Garrison the battalion which had been severely infected by cerebro-spinal fever and which underwent elaborate spraying afterwards suffered abnormally from such complaints as compared with other units who were not being sprayed, there being 72 cases of measles and an excessive amount of bronchial catarrh in the sprayed battalion during April, 1917. The spraying arrangements were under the personal supervision of Major Hine and other officers from the Central Laboratory. The local opinion was unfavourable to the spray.

IV. *Prophylaxis.*

The infection of cerebro-spinal fever is not to be feared under good conditions of housing and ventilation. The early isolation of mild and severe cases and the provision of free ventilation compulsorily, and with sufficient warmth during the time of seasonal prevalence, constitutes the most effective means of prevention.

The proposed prophylaxis of the disease in 1918 is given by Captain Glover.[7] The measures indicate a considerable change from the policy of former years, and as they are stated to have been submitted to the advice and criticism of Colonel Gordon it may be taken that they embody the general aspect of control of the disease in the immediate future. They are as follows:—

(i.) Spacing out of the beds with a minimum interval—reduction of numbers from the mobilisation to the peace scale of accommodation; the provision of increased warmth and extra fuel; the overcrowding of Y.M.C.A. and other institutes, and medical inspection rooms to be limited.

(ii.) Special ventilation to be arranged, the windows to be fixed open, and new ventilating apertures to be provided.

(iii.) Inoculation to be postponed until the second month of service.

(iv.–vi.) The remaining measures deal with the spraying of all troops for six days each month, and the sample swabbing of 100 men weekly to afford a guide to the carrier index. The expediency of the two latter proposals has already been fully discussed.

For the first time it is noted that primary importance is attached to ventilation and overcrowding. Formerly such factors were not regarded as of importance by the officers of the Central Laboratory, judging by the conditions described as prevailing at X Depôt at the commencement of the epidemic, a station which was under the personal observation of these officers for over a year before, as a test in preventive measures, and, in fact, it was stated that "it cannot be said that there were many cases to be attributed to overcrowding."

Overcrowding and Defective Ventilation.

The influence of overcrowding and defective ventilation as factors in the spread of cerebro-spinal fever was very definitely laid down in the writer's report of the epidemic at X Garrison in 1916. The following extracts are given:—

"The infection of cerebro-spinal fever is not to be feared under good conditions as to housing and ventilation. Accommodation was supplied on war scale, nominally at 40 square feet per man, but it was found that this space was not always available. The weather was abnormally cold and wet, and natural ventilation was reduced to a minimum, all doors and windows being closed. Orders were found insufficient to prevent this. The shape of the barrack rooms did not permit of a sufficient interspace between the beds. Unless sufficient fresh air is provided compulsorily and scientifically—i.e., out of reach of the soldier and with regulated draught—it will not be of practical benefit, as it will be put out of action. It is at night that ventilation is essential. Extra blankets should be provided to lessen the discomfort of cold air. Kinemas and crowded institutes are to blame for many cases of cerebro-spinal fever, the Y.M.C.A. huts being the worst offenders. I have inspected such places at night, and from these visits I am convinced that they are a most potent cause of spread of the infection.

On April 2nd, 1916, the minimum floor space was increased to 60 square feet. The doors and top sashes of all windows were fixed in an open position or else removed. The barrack rooms were inspected nightly by company and medical officers to ensure that ventilation was maintained. It is believed that the absence of further cases amongst the troops remaining in barracks was due more to the compulsory fresh air than to the smaller proportionate increase of floor space which it had been possible to obtain. (The troops had again been temporarily on the reduced scale owing to unavoidable reasons).

[6] THE LANCET, Oct. 6th, 1917.

[7] R.A.M.C. Journal, January, 1918.

The lesson would appear to be that ventilation should be compulsorily given, and on a large scale. If absolutely necessary, moderate overcrowding on mobilisation scale may be permitted if the fullest use is made of fresh air. The incidence of cerebro-spinal fever is dependent on the thermometer. When the weather is cold ventilation is decreased automatically. Sunshine has no effect in preventing infection, unless accompanied by heat, as infection takes place in barracks and other places after sundown. Rainfall has no effect, neither has the barometer."

The proposal to defer inoculations until the second month of service will not, it is believed, reduce the well-known increased incidence of the disease amongst recruits. It is based on the known fact that about 40 per cent. of patients have been inoculated within a week of the onset of their illness, but, under present conditions, it is usual for such a proportion of men to have received a dose of inoculation or vaccination during each week of their early service.

Practical Measures Advocated in Original Report.

In conclusion, the following paragraphs may be repeated as concluding the original report:—

"The occurrence of a definite case is heralded as a rule by indefinite cases, and such should be an indication for all concerned to take such steps as the ætiology of the disease suggests. It is not sufficient to issue orders regarding open windows and overcrowding. The rooms should be visited by company and medical officers to ensure that instructions are carried out. Windows and doors will need to be screwed permanently open or removed. Dark blinds over the windows will need to be removed at 'Lights out,' but blankets and fires should be provided to lessen the discomfort of cold air. The ventilation and crowding of institutes requires most careful watching and personal inspection at the busy period of the evening.

On the occurrence of a case in the barrack room extra precautions will be taken on the lines mentioned, and a watch kept for febrile illnesses amongst the remainder. Any men suffering from severe headache, backache, and vomiting should be early admitted to hospital under observation. The contacts of a case do not require to be isolated or swabbed. They can continue their outdoor work as usual and sleep in the infected room for a week at least. During this quarantine period free ventilation should be insisted upon. All febrile cases amongst the troops generally should be at once detained in hospital.

These remarks are written in the hope that they may cause others to consider the possibility and importance of atypical and unrecognised forms of this disease, from the point of view of diagnosis, treatment, prognosis, and prevention. The early isolation of mild and severe cases, rather than of carriers, together with the provision of free ventilation, is suggested as the basis of preventive measures.

We claim to have established a case in favour of the prevalence of mild and atypical cases of cerebro-spinal fever. The influence of such cases in determining the spread of this disease is shown by the proportionate incidence of definite and indefinite illnesses, in units and garrisons, as well as by the many individual instances of mutual infection between them both. If the existence of these cases be admitted, it seems necessary in these circumstances to believe that mild and severe forms are equally potent and important factors as regards the spread of infection if it is considered that mild breeds severe and the severe mild, the resultant disease being dependent only on the susceptibility of the patient receiving the infection. Such considerations necessarily involve a review of the previous methods of the prevention of cerebro-spinal fever." (1916 Report.)

Postscript.

The following extract from the Medical Supplement (July, 1918), compiled by the Medical Research Committee, has just reached the writer—after writing the above. It is given here as it completely confirms the main contentions in the article.

"The significance of meningococcic carriers in the spread of the disease, as reflected in German medical opinion, is summarised by Galambos, who says that though sporadic cases of cerebro-spinal fever were observed in the various theatres of war there were never any epidemic outbreaks. G. B. Gruber regards the search for meningococci carriers and their isolation and disinfection as unnecessary, and states that as regards importance they are on a par with pneumococci carriers. Feser is of the same opinion and has never seen a proved case of infection by contact. The search for carriers is considered by Klinger and Fourmann to be both unnecessary and impracticable. Meningococci were never isolated from the naso-pharynx of 18 cases of cerebro-spinal fever under Galambos's observation, and no carriers were found among the contacts of the patients; he is convinced that isolation of healthy carriers has no influence in preventing the incidence of the disease."

TRAUMATIC RUPTURE OF THE INTESTINE.

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DURING the past five years many accounts of the modern treatment of gunshot wounds of the abdomen have been published, and the results have fully confirmed the opinion held by most surgeons as to the importance of interference as early as possible, given fairly satisfactory surroundings. This conviction led those in charge of the medical arrangements with the British armies to make special provision for dealing with this class of case as soon as possible, thus enabling a large proportion to be treated successfully. These results have never been equalled in previous wars, and will probably never be surpassed.

Traumatic Rupture of Intestine without External Lesion.

In civil life the same need of prompt action arises in cases where reason exists to suspect a perforation or laceration of some part of the gastro-intestinal tract, whether there be a lesion of the overlying structures or not. If no lesion of the skin is evident (and in many cases of abdominal injury where the intestine has been ruptured it has not been possible to find any) it requires firmness to induce the patient to submit to operation before peritonitis has made the need for operation obvious to the patient's friends. Waiting imperils success and often ensures failure. It is not always remembered by those in charge that septic peritonitis will be commencing within six hours and quickly spreads when it has begun.

Traumatic rupture of the intestine without an external wound is one of the catastrophes of civil life against which it is not possible to guard. There are many ways of causation, but practically no remedy without operation, and early operation. Peritonitis of the worst type inevitably supervenes. Although a few cases have been saved by surgical interference when peritonitis has been advanced, the loss of every hour makes the odds against recovery more formidable. It is far better to operate in a doubtful case and find contusion or slight laceration of some internal organ than to allow a valuable life to be sacrificed through a mistaken trust in the possibilities of treatment miscalled conservative.

In some of the more serious cases the shock is so intense that although the surroundings may be favourable the surgeon is compelled to wait. Still, there is a great responsibility on him to take the measures best calculated to enable the essential operation to be done as soon as possible.

Record of Case.

The following is the record of a case of rupture of the jejunum with laceration of the mesentery and intraperitoneal hæmorrhage.

A boy, aged 15, was admitted to St. Thomas's Hospital on August 29th, 1916. At mid-day he was riding a tradesman's tricycle, when a van ran into it and knocked him off. He was unable to give a clear account of the accident. He was suffering from shock and complained of severe abdominal pain. Normal urine was withdrawn by catheter. He was put to bed and warm blankets and hot-water bottles applied. At 2 P.M. the shock was still very severe and he complained much of the severity of the abdominal pain. He was white, with blanched lips, a subnormal temperature, and pulse of 118. He was lying on his left side with limbs and trunk flexed. Respiration almost entirely thoracic, the abdomen not moving. The muscles of the abdominal wall were rigid, but not board-like, and he was generally tender in this region. Pain was referred to a point about 3 inches above the umbilicus under the left rectus muscle. No evident injury to the skin. Dullness on percussion extended from the left flank to the level of the umbilicus when he was examined in the position assumed as the most comfortable. During the afternoon, whilst we were waiting for him to revive somewhat from his collapsed state, he vomited and became restless; there was also increasing dullness in the abdomen and continuing pain.

Operation.—At 4 P.M. a general anæsthetic was administered and the abdomen opened by a vertical incision about 6 inches long to the left of the middle line. The rectus sheath was opened and the muscle drawn outwards. The peritoneum had a bluish colour from underlying blood, which escaped in considerable quantity when the incision was extended. There was so much more than is usual in these cases of traumatic rupture of intestine that the spleen and liver were at once examined; they were without trace of injury. When the

omentum had been displaced to the left a large transverse rupture of the jejunum presented. This was situated about 6 inches from the duodeno-jejunal junction and extended over five-sixths of the circumference of the gut, there being only a strip of the mucous membrane on the mesenteric aspect, which appeared normal. This was wrapped in gauze to prevent further escape of fæculent fluid until the source of the bleeding had been discovered. This proved to be a tear in the mesentery behind the lacerated gut; in this a vessel of some considerable size had been torn. Other small lacerations were found near it, whilst an irregular laceration of the parietal peritoneum to the right of the spine, about the level of the umbilicus, required one or two sutures. The tear in the jejunum was also bleeding and the edges were bruised, so after the application of clamps excision of this part was performed, for a distance of 3 inches above and 3 inches below the rupture, and an end-to-end union made. The mesenteric lacerations were sutured. No. 1 silk was used for the anastomosis, an inner continuous uniting all the coats, and an outer Lembert, also continuous, covering in the line of union. The abdomen was cleansed, but owing to the evident contamination from intestinal contents a tube was left in. The small intestine was nowhere inflamed, but near the tear were some brownish patches, which did not come away on sponging. During the operation saline was infused intravenously. The pulse rose to 160, falling later to 120.

On the following day the pulse was improving though still rapid, and the boy was better. On the 31st he complained of pain and tenderness in the abdomen, and vomited. The lungs appeared clogged with mucus, there being moist sounds all over. Respiration 48, pulse 130. Dr. G. Hoffmann, who saw him for me, advised adrenalin and a mixture containing potassium iodide. Atropine and morphia injections were required to relieve his pain. There was little discharge from the tube, which was removed on the fifth day.

On Sept. 2nd the bowels acted freely, but his chest complication did not recover until Sept. 5th, when the pulse had come down to 96 and the temperature returned to normal. He left the hospital for a convalescent home on Sept. 27th.

A few months later he had a somewhat severe attack of pain in the abdomen which alarmed him, but this was traced to over-indulgence in raw chestnuts, and soon passed off after appropriate treatment.

Diagnosis.

After an injury which may have caused a rupture of some part of the intestinal tract there may be a group of symptoms making diagnosis certain and enabling decision at once, but there is no one symptom always present. Certain cases do not show leading symptoms until some hours have passed, and then a rapid change takes place.

It is not necessary here to repeat a list of symptoms which are very well illustrated by the above case, and which are found, luckily, in a majority. There is an agreement about this group and the indications to be generally expected, which I have dealt with elsewhere.[1] I should like to draw attention to two points: (1) the occasional rise of temperature; (2) the state of the abdomen.

A rise of temperature to 103° F. and over may be found when other symptoms are not well marked, and should be regarded as indicating a definite lesion of the wall of the gut, and one which requires repair. There may not be a lesion which has opened the lumen of the bowel; it may only involve the external layers, but it may become complete secondarily; therefore it requires repair. Incipient inflammation of the lungs secondary to an accompanying traumatism of the chest must be excluded by examination.

The usual state of the abdomen is one of immobility due to rigidity of the muscles, and, although there may be great tenderness, there is seldom dullness in the flanks. There may be dullness directly over the lesion, but this is usually quite restricted in amount and due to collapsed gut with slight hæmorrhage and some escape of contents. If there is abnormal dullness in the flanks, it may be the result of hæmorrhage from laceration of the mesentery, spleen, or liver. But the instances in which the state of the abdomen is recorded with reference to this point are not so numerous as we could desire.

The presence of free gas in the peritoneum, even in small quantity, appears to be somewhat rare if we consider the number of cases in which it was found when the peritoneum was opened. Mention is made of it in 5 only of the series of 132 brought together by Berry and Giuseppi; of these, 4 were ruptures of the jejunum, the opening in one instance being the size of a threepenny-bit; in 1 it was present on the twelfth day after a secondary perforation an inch below the sutured one. Others appear in records to which we have access at the present time, but in only one successful case, an operation 20 hours after the injury, was there distension with loss of liver dullness. Loss of liver dullness after subcutaneous rupture of the intestines usually indicates a late stage, and is of bad prognosis, being caused by overlapping of the hepatic border by distended and paralysed intestine. Berry and Giuseppi say:—

"In several cases in which operation was not undertaken until absence of liver dullness had been noted, not one of these recovered."

In traumatic rupture there is collapse of the gut near the laceration, and the contents of the intestinal canal are therefore less likely to escape than they are when a pathological perforation is present. Free gas, and in large quantity, is common after perforation of an anterior gastric ulcer, but if the ulcer is small there may be none. It is seldom capable of demonstration after duodenal or jejunal perforations, although some may be found when the peritoneum is opened. Emphysema of the abdominal wall without accompanying fracture of ribs indicates a lesion of the duodenum or large bowel.

Operation.

The special points to be remembered in the operation for suspected rupture of the intestine are the following:—

1. The incision should be a long one, extending well above the umbilicus, as this gives best access to the root of the mesentery, and permits of most rapid examination of the abdominal contents. If the rectus muscle is temporarily displaced outwards and the posterior layer of the sheath divided well to the left of the mid-line (and it is best to place the whole incision to the left) there will be no danger of subsequent hernia.

2. Blood or fluid which has accumulated should be washed away with moist sponges and a search made for the source of the bleeding. When hæmorrhage has been arrested the damaged section of gut is looked for; this will usually be found in a line between the point struck and the spine. Before this is treated search should be made for a second point of rupture, for there is more than one in some 20 per cent. Apparently lesions of the upper jejunum have proved difficult to find, for those in this position have been overlooked in several instances, only to be revealed post mortem. Ruptures of the duodenum give the most anxiety, because there is usually excessive shock causing delay in the operation, great difficulty in localising the lesion, and when it is found more manipulation is needed to remedy the damage, the time thus required further imperiling the success of the operation.

3. Treatment of the lesion found will depend upon the extent of damage to bowel wall and to mesentery. A large laceration may be clean edged and as safely secured with a double suture of silk or other material as those of smaller size, but if the damage to the wall of the bowel is severe or there is another opening close to the one which was first discovered it may be necessary to resect and perform an anastomosis. The sutures will thus be placed in healthy tissue and valuable time saved. It is quite impossible to lay down hard-and-fast lines as to whether the laceration should be sutured, resected, &c., or not. Most recoveries, as would be expected, were after rapid suture. The use of Murphy's button did not prove very satisfactory, partly because it was used by operators who were hurried by the critical state of their case. Temporary artificial anus in the small gut is only to be tried when there is no time for anything beyond. Still, it must be recollected that John Croft's first case lived one month, only dying then (after secondary resection) from exhaustion.

4. Closure of the abdominal incision may be effected in the majority without drainage of the peritoneum; if drainage is required a suprapubic "stab-incision" will suffice, the tube being passed deeply into the pelvis. The course followed should depend on the presence or absence of peritonitis and the possibility of cleansing the infected peritoneum. When in doubt drain and place the patient in the Fowler position. When drainage is established much benefit may be derived from the use of continuous administration of saline by rectum during several hours.

Statistical Data.

In compiling statistics of a series of cases such as these it is somewhat difficult to avoid overlapping, and therefore a

[1] THE LANCET, 1916, i., 587.

want of accuracy, unless great care is exercised. The available records extend for useful purposes from the first case operated on by John Croft in 1888 to the end of last year, 1918. In the oration on Internal Abdominal Injuries given before the Medical Society of London [2] (1910), a list was given adding to that by Berry and Giuseppi.[3] Another useful addition was made by Raymond Johnson [4] in 1914, whilst St. Thomas's Hospital Reports and the medical journals have supplied others, completing, I believe, the list of those available from Great Britain. This gives a total of 221, comprising 200 males and 21 females.

Of these, 43 are derived from the records of St. Thomas's Hospital, of which number 33 were submitted to operation and 11 recovered. In 10 no operation was performed, chiefly because the condition was too bad from shock, general peritonitis, or the complication of some severe injury. One refused operation. Of these, life was prolonged in four for six days, eight days, four weeks, and four weeks respectively. Of the general series, 124 operations were performed with 48 recoveries and 76 deaths.

The hospital cases (St. Thomas's) are all given and include every case admitted, whether moribund or not, whereas the other statistics are from many sources and put the results in too favourable a light. Many fatal cases have not been published.

Cause and Site of Rupture.

The cause of the rupture is shown in the accompanying table, which also gives the part of the bowel injured. I have not included two cases of traumatic rupture produced by gunshot of the wall of the abdomen without wound of the peritoneum, although from a surgical point of view they are unusually interesting.[5] No case is included from any of the hospitals since those published in the list given by Raymond Johnson, unless published separately in the Journals. This statement does not include St. Thomas's Hospital.

—	Duodenum.	Jejunum.	Ileum.	Small gut.	Large gut.	Totals
Run over in street ...	16	41	13	1	3	74
Kick on abdomen... ...	1	17	10	—	—	28
Crushed	8	6	8	—	3	25
Struck by moving body	4	18	11	—	2	35
Fall of weight on body...	—	6	6	—	—	12
Fall	2	12	11	—	2	27
Other causes	1	11	—	1	1	14
—	32	111	59	2	11	215

Position and cause not given in 6. Of the 21 females 15 were run over in the street.

Summary of Other Cases.

Other cases which have been under my care are the following:—

Male, aged 24. Jejunum, ruptured in two places: (1) Resection of 13 inches, and lateral anastomosis; (2) end-to-end with plates. Six hours after kick from horse. Lived 6 days; peritonitis from giving way of suture in end-to end anastomosis.

Male, aged 27. Ileum; rupture ½ inch; sutured; drainage. Fifteen hours after run over drunk; 10 days later abdominal wound gave; re-sutured. Albuminuria and pulmonary symptoms. Lived 26 days.

Male, aged 50. Ileum; 3 ruptures; sutured; drainage. Immediate operation when admitted on fourth day with peritonitis; died a few hours later.

Female, aged 33. Splenic flexure; openings into peritoneum sutured. Retroperitoneal opening sutured; drainage of this. Operation 10 hours after run over. Recovered.

Male, aged 5. Ileum. Small opening sutured; 3 hours after knocked down by horse. Broncho-pneumonia. Recovered.

Male, aged 15. Jejunum. Resection and end-to-end anastomosis for transverse rupture. Laceration of mesentery. Acute bronchitis. Recovery. Case described above.

Two other instances admitted to my wards. 1. Rupture of duodenum. Operation abandoned because of rapid collapse of patient, did not permit of adequate exploration. 2. Operation by resident assistant surgeon after secondary giving way of damaged part was unsuccessful, and peritonitis proved fatal.

[2] See also The Acute Abdomen, 2nd edi ., W. H. Battle.
[3] Trans. Roy. Soc. Med., ii., 1909.
[4] Loc. cit., No. 3, 1914.
[5] Meyer, Dew, and Stokes: THE LANCET, 1915, ii., 1140.

A NOTE ON

THE VALUE OF SOLID PARAFFIN WAX IN FACIAL SURGERY.

BY SPENCER MORT, M.D., CH.B. GLASG., F.R.C.S., F.R.S. EDIN.,

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FOR years melted wax has been advocated in filling in defective parts and raising the skin and superficial tissues of depressed areas, especially in injuries and defects of the nose. Since the war, I have operated on a good many cases of facial deformities, particularly in the earlier months before the Special Face Hospital was established at Sidcup. I regard all facial defects as worthy of the highest art of surgery. Patience, with dexterity, will repay all the trouble expended, as a good result will brighten a patient's life.

Having experimented with all kinds of plastic and solid material for the reconstruction of face defects, I suggest solid wax, pure hard paraffin, of melting point 110°–115° F., for introduction into the tissues as a permanent splint. Melted paraffin has many disadvantages, and personally I find it almost hopeless. The syringe usually gives great trouble, and the wax is put in hot and scalding or else it solidifies in the needle. Press hard on the plunger and a quantity may suddenly be thrown under the skin, solidifying in a lump at the wrong place, and not to be extracted without scarring. Further, melted wax will adapt itself to the skin tissues probably in the wrong place, instead of which we should have skin tissue moulded and adapted to the shape of the wax. Cases, too, have been known of sudden blindness following melted wax injections.

For these reasons, principally, I am using solid, cold wax, cut to shape, and introduced through a small prick. All the above disadvantages are eliminated.

Technique.

The following is the technique in the case of saddle-nose: (1) Sterilise the wax efficiently by melting in a pot.* If surgical wax is not obtainable a Price's candle melted is a good substitute. (2) Make a quarter-inch prick near the depressed part with a tenotome. (3) Elevate around the incision to the required extent with a small elevator. (4) Have the wax poured out to depth of about half an inch in a porringer and solidified in a basin of cold sterile water. (5) Remove the wax *en bloc* from the small dish with an elevator. (6) Break to size (it will not cut properly) and afterwards trim the small splint to shape with a knife. The little shaped splints are about ¼ × ¼ × ¼ inch. Several may be deposited in the one subcutaneous tunnel. (7) Push the wax into its place through the incision, stitch the wound with a fine catgut stitch, and apply a collodion gauze dressing. It will be found best in practice to do these operations in stages, and just too little at a time. More can be done later. Small pieces of wax will lie in the tissues undisturbed and unabsorbed; larger bits might work out through the wound. A useful practical hint is to avoid smearing the little incision with wax, as this tends to delay primary union of the skin edges. Rather drop the piece right into the undermined skin, then push it home. At the conclusion of the operation a vigorous massage of the nose while the patient is still under the general anæsthetic will be found to give an artistic finish to the part. The operation is splendidly simple in actual detail.

In conclusion, I have found melted wax of no service for hide-bound scars to be elevated. These must be raised by undermining with a raspatory through a small incision and kept in position by a solid bar of wax. The cases I have recently operated on have, indeed, been gratifying in their success, and so I venture to propose this method for certain special surgical cases. A depressed skin deformity of an unsightly nature on any part of the body may be similarly treated.

Edmonton.

AT Ilfracombe it has been decided to provide an X ray apparatus, with a suitable building, in connexion with the Tyrrell Cottage Hospital, as a war memorial. The cost of the scheme is about £1000.

THE EXPECTATION OF LIFE IN PULMONARY TUBERCULOSIS,

WITH SPECIAL REFERENCE TO PENSIONS ASSESSMENT.

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IN assessing the disability of discharged men for pension purposes various factors require to be considered. In practice the probable percentage defect of working capacity over a certain period is the main concern of a Medical Board; but other forms of disability have bearing on pension assessment, and an important one is the extent to which disease or injury, attributable to or aggravated by Army service, is likely to shorten life.

In many cases of gunshot wound, for instance, although working capacity is impaired, it can safely be assumed that the probable length of life will not materially differ from that of the average individual of the same age. Where, however, the disability arises from certain types of injury, and especially from disease, it includes curtailment of life as well as immediate reduction of working capacity, as, for instance, in cases of malaria, nephritis, chronic dysentery, heart disease, pulmonary tuberculosis, &c. In some diseases, indeed, it is possible that this factor is more important than the other.

For most of these diseases, however, insufficient information is available to enable the probable duration of life to be estimated, but it should be possible to come to some estimate in the case of pulmonary tuberculosis, which has now been a notifiable disease for a number of years, and concerning which fairly reliable statistics are in existence. Parenthetically, it may be remarked that if such information can be utilised for national purposes, it is an argument for some form of notification of diseases, whether they come under the category of infectious or not.

The figures quoted in this article have been taken from a detailed analysis of the after-history of cases of pulmonary tuberculosis compiled for departmental purposes.

Expectation of Life in Notified Male Cases of Pulmonary Tuberculosis.

Table I. shows the percentage of male survivors distributed in age-groups at May 31st, 1917, of patients who were notified as suffering from pulmonary tuberculosis during the calendar years 1910 (when notification was introduced) to 1916, and concerning whom information was available at the date of inquiry. The average time between the notification of each group and the date of inquiry varies, therefore, from rather less than seven years to less than one year.

TABLE I.

Pulmonary tuberculosis: 7169 male patients notified 1910–1916; percentage surviving at May 31st, 1917.

Year notified.	Age-groups.						
	15–20	20–25	25–35	35–45	45–55	55–65	65+
1910... ...	12·3	13·7	14·1	19·4	26·0	21·0	9·8
1911... ...	15·6	17·6	20·6	18·8	16·9	4·8	Nil.
1912... ...	25·5	27·1	22·4	27·0	16·8	12·4	6·7
1913... ...	30·0	30·1	30·5	26·3	15·7	10·6	4·0
1914... ...	31·5	38·2	35·6	35·0	31·8	27·5	5·4
1915... ...	38·5	47·9	43·2	37·9	34·6	21·4	14·3
1916... ...	60·9	78·1	60·9	53·4	42·4	47·1	26·5

Patients under 15 years of age are not included, partly because there is a high proportion of wrong diagnoses at these ages and partly because such statistics would not be applicable to ex-service men. It will be observed that, especially at the higher ages, the percentage survival of cases notified in 1910 is actually higher than among those notified in more recent years, indicating that at the commencement of notification there was a greater tendency to notify elderly patients who were probably suffering from some other disease, such as chronic bronchitis. It will also be noted that the percentage survival of cases at the age-period 20–25 is consistently somewhat higher than in other age-groups. Apparently the disease kills less rapidly at these ages.

The general trend of the figures suggests that if the information covered a longer period of time the percentage survivals would follow the course of a geometric progression. If the survivals for the age-groups 15–45 (comprising 5033 cases) are combined, eliminating the less accurate readings at higher ages, and a curve is drawn approximately to fit the percentages, it is found that, especially for survivals after two or three years, the curve follows approximately that of a geometrical progression and a factor can be easily calculated which will carry it on until it meets the base line. From a combination of the actual and hypothetical figures, rearranged to give survivals at 6 months, 1½ years, 2½ years, and so on from the date of inquiry, an expectation of life has been calculated and found to be 3·4 years. A separate estimate for the age-group 20–25 gives an expectation of 3·5 years, the difference, therefore, being so slight as to be negligible, in view of the fairly large error carried by any such rough method.

"Arrested" or "Improved" Cases.

The above calculations apply to all male notified cases at the ages mentioned. The average age of these patients at date of notification closely approximates to 30 years. They include cases at all stages of disease and probably many in whom the diagnosis is wrong.

It is important to obtain some estimate of the expectation of life of patients in an early and hopeful stage of the disease and in whom also the diagnosis has been established with reasonable accuracy. For this purpose the after-history of a group of patients of the sanatorium[1] grade when they first came under notice, was followed. Only those who were discharged from sanatorium with disease "arrested" or "improved"[2] were included, and all those concerning whom the diagnosis was considered wrong or very doubtful, as well as those about whom information was not available at the date of inquiry, were discarded. The absence of tubercle bacilli in the sputum was not regarded as an essential factor in diagnosis, as it is a well-established fact that many true cases of pulmonary tuberculosis occur in whom tubercle bacilli are rarely or never found in the sputum. The patients were mostly insured persons coming from and returning to homes in Glasgow.

Table II. deals with a group of male patients admitted to sanatorium for the first time and discharged therefrom with disease "arrested" or "improved" between 1911 and May 31st, 1916, comprising 631 cases. It shows the percentage of survivals at May 31st, 1916, May 31st, 1917, and May 31st, 1918. Deterioration is obviously occurring rapidly.

TABLE II.

Pulmonary tuberculosis: 631 male cases discharged from sanatorium with disease "arrested" or "improved" before May 31st, 1916.

Date of inquiry.	Per cent. surviving.	Average time elapsed since discharged from sanatorium.
May 31st, 1916	81·4	22 months.
May 31st, 1917	66·8	34 ,,
May 31st, 1918	55·0	46 ,,

The information can be analysed in more detail, however, and may be stated as in Table III.

TABLE III.

Pulmonary tuberculosis: 631 male cases discharged from sanatorium with disease "arrested" or "improved" before May 31st, 1916.

Date of enquiry.	Per cent. surviving after lapse of average periods from discharge in months.					
	6	18	30	42	54	66
May 31st, 1916 ...	97·2	79·4	73·4	72·5	—	—
May 31st, 1917 ...	—	82·6	66·7	58·2	53·3	—
May 31st, 1918 ...	—	—	67·7	58·9	45·8	44·0
Averages ...	97·2	81·0	69·6	61·9	48·3	44·0

[1] The term sanatorium, as used here, does not include tuberculosis hospitals for advanced or chronic cases.

[2] Roughly, 75 per cent. of discharged sanatorium males.

In this table the percentage of survivors is again shown separately at May 31st, 1916, May 31st, 1917, and May 31st, 1918, but the cases have been split up into groups discharged severally at intervals of, on the average, six months up to 5½ years. The results, where they exist for the same period in more than one group, are combined in the last line of the table, so as to reduce errors of chance. These percentages form the basis of a very crude life table and the expectation of life calculated as above is found to be 6·6 years. The average age is again 30 years.

Expectation of Life compared with the Normal.

The expectation of life calculated for so-called "arrested" cases alone is certainly greater, but the number of cases is so small (117 males) that it is impossible to place much reliance on any conclusion drawn from their study. The expectation of life calculated as before is, roughly, 14 years. This figure must be regarded as little more than a guess. It is probably too high, since the cases in whom arrest was obtained included a number where an element of doubt as to the diagnosis remained. Moreover, it must be admitted that the differentiation of mere improvement from arrest depends largely on the predilections of the medical officer estimating the result of treatment, so that patients discharged from one sanatorium as "arrested" would be discharged from another as "improved" and vice versa.

Now the expectation of life of a male, aged 30 years, in Glasgow was 29·68 years for the period 1881–1890,[3] and may be taken for practical purposes as 30 years for the period covered by this inquiry. The expectation of life of the "arrested" case of pulmonary tuberculosis is therefore less than half the normal, and of the "arrested" and "improved" ex-sanatorium cases taken together roughly a fifth of the normal.

In view of the fact that the average age of discharged tubercular soldiers is probably under 30 and the normal expectation of life, therefore, greater than 30 years, the probable curtailment of life itself would appear to be justification for assessing for pensions purposes all verified cases of tuberculosis with "arrested" disease at least at 50 per cent., and preferably at 60 per cent. In the opinion of the writer, fitness for work should not be stressed in fixing the minimum assessment.

Graduated Assessment.

The graduated assessment of disability in cases of pulmonary tuberculosis, according to the character and stage of the disease, presents difficulties which are of the same nature as those discussed at the commencement of this article.

Broadly speaking, a patient who is suffering from the more chronic form of the disease, who will not derive benefit from sanatorium treatment, and who is not urgently requiring a bed in a hospital, will benefit psychologically and will not materially suffer from a moderate amount of work of a suitable kind, although his prospect of life is brief. It would seem desirable to avoid creating an impression that the pursuit of employment on the part of an ex-service man will affect the assessment of his pension, and rather to aim at providing him with maintenance on a level entirely dependent upon the character and stage of the disease. Further, the local authorities responsible for the institutional treatment of tuberculosis admit many patients for preventive reasons and not mainly because of the patient's clinical condition. The tendency is to assess such men as totally disabled. The ex-service man who has a comfortable home and chooses to remain there and to do a certain amount of work suffers in comparison with the careless patient who, on account of his poor home surroundings, is admitted to an institution and is therefore assessed as a person requiring institutional treatment. Practically, the problem can best be solved by a liberal assessment in all unequivocal cases of tuberculosis of the lung, and the inquiry recorded above indicates the justification for such a policy even toward arrested cases.

Difficulties in Estimating the Activity of the Disease.

The presence of disease which is actively progressive, as indicated by bacteriological and X ray examination, physical signs, continued loss of weight, swinging temperature (actually observed or recorded by the medical officer of a Public Health Department or institution dealing with the case), rapid and unstable pulse, &c., is sufficient ground for an assessment of 100 per cent.

The graduated assessment of men below 100 per cent. but above the minimum assessment permitted is bound to be associated with a large error, and the solution is probably to be found in diminishing the number of possible intervals. The writer's own experience is that the more familiar one is with this disease the more one will hesitate to make a prognosis, and assessment is, after all, a prognosis in accurate terms. The chronic fibroid type of disease may be associated with a considerable degree of unfitness for work and yet with comparatively prolonged life. On the other hand, the expectation of life of a patient with a small active lesion at one apex may be very much shorter.

In the writer's opinion the extent of lung tissue involved is of limited value for prognostic or assessment purposes, and forms of classification such as the Turban, Turban-Gerhardt, or that based on the number of lobes diseased, suffer in practice from the undue emphasis laid on the local condition as estimated by physical examination. Even where provision in the classification is made for taking account of the patient's general condition, the majority of observers are naturally influenced in their estimation of the general condition by their observation of the extent of lesion. A measure of the activity is what is wanted, and disease of low activity, but not arrested, would naturally fall into the intermediate grade.

Proposed Method of Assessment.

The method suggested is that cases of tuberculosis should be assessed in three grades: all those with actively progressive disease at 100 per cent., those in whom the disease is arrested at 60 per cent. or 50 per cent., and all those intermediate at 80 per cent. or 70 per cent. It requires to be emphasised that the presence of actively progressive disease is to be estimated not merely by the presence of râles or of tubercle bacilli in the sputum, but should be based more on the patient's general condition, especially as observed after the lapse of a period of time since his discharge from the Army; but in this matter the writer believes that guidance of the highest value may be obtained from examination by X rays. Whatever may be the limits of X ray examination—and these remain to be clearly defined—there is no doubt that actively progressive disease shows very clearly on a properly taken X ray negative as clouded or steamy shadowing.

The proportion of ex-service men falling to be assessed as "arrested" cases will probably be fairly high. It is a fact that many discharged soldiers who first showed evidence of tuberculosis in the Army, and in whom the records indicate that the diagnosis has been accurate (showing, for instance, the presence of tubercle bacilli in the sputum), are working regularly after a year or two and keeping in remarkably good health without ever having received sanatorium treatment. Many of these men who come before pensions boards show no present signs whatever of disease.

The facts suggest that ordinary treatment in a military hospital has been sufficient in their case to effect an arrest of the disease, and it is possible that they are evidence of the value of early diagnosis, arrived at as the result of the readiness of men on Army service to report sick before they have reached that degree of infirmity which generally leads a man in civil employment to give up work and seek treatment. It is possible, also, that many men with fairly strong natural immunity to tuberculosis have contracted the disease under abnormal war conditions of physical and mental stress associated with a manner of life conducive to infection, and that as soon as they have been removed from these conditions their natural recuperative powers have effected a cure. However this may be, the impression of the writer is that the percentage of "arrests" among discharged soldiers, and particularly among those who were not sent to sanatorium direct from the Army, is above the level of civilian experience.

The policy suggested implies, of course, that the greatest care will be taken to eliminate all cases of wrong diagnosis, and there is no doubt many such have occurred among men discharged from the Army as suffering from tuberculosis. The elimination of these will probably become simpler in the course of time, but in the meantime cases in which there is grave doubt whether the men ever suffered from tuberculosis might be dealt with entirely on their own merits and

[3] A New Life Table for Glasgow, by Dr. A. K. Chalmers.

irrespective of any definite grading adopted for established tuberculosis. All men in whom there is a record of tubercle bacilli in the sputum, even if unequivocal physical signs have never been detected, must, for practical purposes, be regarded as definite cases, although in some instances confusion of specimens submitted to a bacteriologist may have occurred.

Summary.

1. The expectation of life of males aged, on the average, 30 years, notified in Glasgow as suffering from pulmonary tuberculosis is about 3½ years.

2. The expectation of life of male cases at a sufficiently early stage of the disease to raise hope of recovery is about 6½ years.

3. The expectation of life of male sanatorium cases discharged with the disease "arrested" is estimated at somewhere about 14 years.

4. The normal expectation of life of all males in Glasgow at the age of 30 years may be taken as 30 years, but was probably higher for the period covered by this inquiry.

5. The above calculations, applied to the assessment of soldiers and sailors discharged with pulmonary tuberculosis, justify a minimum assessment of 50 or 60 per cent., and this should apply to men in whom the disease appears to be arrested for the time being.

6. All cases where the disease is actively progressive, as measured by general signs and symptoms, physical signs, bacteriological and X ray examination, should be assessed at 100 per cent. disability.

7. All others—i.e., cases of low activity such as those of the chronic fibroid type—should be placed in one grade at 70 or 80 per cent. disability.

THE LYMPHOIDOCYTE AND ITS CLINICAL SIGNIFICANCE.

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THE lymphoidocyte is now regarded as the original ancestor both of the red and white corpuscles of the circulating blood. Amongst the evidence for this view, weight may be attached to the fact that in the fœtus up till about the sixth month it is the only blood cell found in the lymph nodes and bone-marrow. From this period onwards the intermediate forms leading to the fully developed erythrocytes and leucocytes begin to appear in a definite sequence. After birth the lymphoidocyte is never found in the peripheral circulation in health, but may be present in certain diseases. When we attempt, however, to determine its pathological distribution in the blood we are met with two initial difficulties.

Nomenclature of the lymphoidocyte.—The first is one of nomenclature. Such is the confusion in which the literature of hæmatology has become involved by the multiplication of terms that the lymphoidocyte is found to possess no fewer than 89 synonyms. In the case of some authors it is almost impossible to ascertain to what type of cell their communications refer.

The panoptic stain.—Secondly, it is essential that the panoptic stain shall be employed, otherwise the characteristic structure of the nucleus, by which the lymphoidocyte can easily be recognised, is not well brought out. With Jenner's or Wright's stain, for instance, a lymphoidocyte may easily be mistaken not only for the pathological leucoblast, but even for a normal large hyaline cell. The same difficulty occurs, though to a less extent, with Leishman's stain, which has also the disadvantage of occasionally giving rise to nuclear precipitates. It follows, therefore, that many of the deductions of Ehrlich and his school before the introduction of the panoptic stain must be received with caution.

After making such allowance as is possible for these difficulties, we find that the occurrence of the lymphoidocyte in the peripheral circulation, though recognised in the case of the leukæmias, particularly those of the lymphatic type, is not mentioned in other diseases. The tacit assumption is made that its presence is associated with a marked total lymphocytosis. I fail to find any reference in the English text-books of pathology to its clinical prevalence, though Gruner gives a full account of its biology.

Recently, however, I have had the opportunity of examining blood films from a series of cases of subacute bacterial endocarditis of the Libman type under the care of Captain H. J. Starling, M.D., at the Sobraon Military Hospital. Working with the panoptic stain and full controls I have so far found it in 10 out of 11 cases in the following proportions:—

Case 1, 6 per cent.; 2, 10 per cent.; 3, 2 per cent.; 4, 6 per cent.; 5, 4 per cent.; 6, 7 per cent.; 7, 7·5 per cent.; 8, 7 per cent.; 9, 8 per cent.; 10, 5 per cent.

This type of endocarditis appears to be invariably fatal, and of these cases Nos. 3, 4, 5, 6, and 7 are already dead and 1 is moribund.

As I hope to publish the hæmatology of these cases in extenso later on, I do not give further details, my present object being simply to record the presence of lymphoidocytes. I may say, however, that in no case was a marked leucocytosis present, and that it is possible to exclude any type of pernicious anæmia or leukæmia. It is evident, therefore, that their occurrence is not limited to the essential blood diseases.

The question then arose whether the appearance in the peripheral blood of this, the most primitive, type of cell, might not be of wider distribution and significance, whether it might not possibly be a sign of grave illness from divers causes. I therefore examined films from certain other cases, with the following results:—

CASE 11 and 12.—Moribund from old age, there being no clinical or pathological sign of any other disease; lymphoidocytes present in both to the extent of 6 per cent. and 2 per cent. respectively. Both films showed a moderate total leucopenia with slight relative lymphocytosis. Neither patient incidentally had shown any sign of influenza or tuberculosis.

CASE 13.—Moribund from gangrene of both legs. Lymphoidocytes 2·5 per cent.

CASE 14.—Diabetes. Lymphoidocytes 2·5 per cent.

CASE 15.—Carcinoma of liver. Lymphoidocytes 4 per cent.

The lymphoidocyte is well recognised in hæmatological literature, and many excellent drawings of it are published in the Folia Hæmatologica and in Gruner's Biology of the Blood Cells. The cell varies in size, but is usually about that of a large hyaline; its nucleus rarely fills the cell and is usually oval or slightly notched. It stains more faintly than that of either a leucoblast or a large lymphocyte or hyaline, and is distinguished by containing from two to four definite nuclei. The protoplasm is scanty, basophilic, and never granular.

It would seem desirable that extended investigation should be made on the pathological distribution of the lymphoidocyte in order that its full significance in the peripheral blood may be determined. I publish this note, therefore, mainly with the object of drawing the attention of other workers to the point. I should add that the staining reactions were controlled by observations of normal blood and marrow films, which were repeated on the examination of each case. Typical lymphoidocytes were obtained for comparison from smears from fœtal bone-marrow, and from two cases of myeloid and lymphoid leukæmia respectively.

So far films from the blood of 10 patients who were not suffering from any obviously fatal disease have been examined, but without finding any cells that even resembled the lymphoidocyte. These comprise: Influenza + pneumonia, 6; carbon monoxide poisoning (recovering), 1; aortic disease with fair compensation, 3.

ROYAL CORNWALL INFIRMARY, TRURO.—The governors of this charity have recently issued an appeal for £8000 in order to equip the institution with adequate modern sanitary accommodation and to make provision against fire, and also for other improvements. About £3000 have been raised for the scheme.

Dr. W. S. Thayer, of the Johns Hopkins Medical School, Baltimore, in a paper read before the Annual Congress of American Physicians and Surgeons, advocated the establishment of rehabilitation camps for civilians in time of peace, and said that the practicability of such a course had been shown by the war.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF PSYCHIATRY.

A MEETING of this section was held on July 11th, Dr. WILLIAM MCDOUGALL, the President, being in the chair. After announcing a letter of regret for his unavoidable absence from Dr. Bernard Hart, the President formally introduced Professor JUNG, who had come from so great a distance to read his paper on

The Psychogenesis of Mental Disease.

Professor Jung dealt with the history of the materialistic dogma in psychiatry, according to which a disease of the mind is a disease of the brain. Even to-day the alienists considered physical ætiology a matter of primary importance and psychogenesis as of very secondary interest. He quoted instances to show how this leads frequently to the neglect of important psychological factors. The origin of this misconception was to be found in our system of education. The neurologist receives a grounding in the natural sciences only, whereas a knowledge of psychology is essential to everyone who may be called on to treat mental disease. Then, too, under the present system only the most extreme cases of disease come before the alienist, who has thus no opportunity to study the early phases of mental disease. Apart from minor troubles such as phobias and obsessions, paranoia, hysteria, katatonia, and dementia præcox were the chief diseases in which no histological changes could be found in the brain. He admitted that in the last named changes did sometimes occur, but suggested that the toxins which produced degenerations might be formed in the course of the disease and be a secondary factor. Neurasthenia might be regarded as a mild form of dementia præcox, and in many cases the disease never reaches that aggravated form in which it is usually regarded as almost incurable. The worst cases of katatonia were, he thought, often due to the maladministration of overcrowded asylums, for cases of dementia præcox reacted to their environment in a way which would hardly be expected if one were dealing with an organic disease.

Illustrative Cases.

Professor Jung then related four cases of katatonia in support of his thesis that this disease is psychogenic in origin. In the first case the patient had had an unhappy love affair in a certain town, as a result of which he had quitted the locality, intending never to go back. On account of the fact that he had relatives in the district he did, however, eventually return, and on this occasion was seized with his first attack of katatonia. He recovered and remained perfectly well until he again revisited the scenes of his unhappy experience. Immediately upon returning for the second time he once more became katatonic. So that in six years the only occasions on which the patient was seized with this illness were those on which he was confronted with a powerful array of distressing memories. Another convincing narrative was told of a woman who, in the course of a family fracas, had been stigmatised by her husband as "mad," whereupon she had said, "Very well, if you call me mad you shall see what it is like to be mad," and had at once become so violent that she was removed to the mental clinic. There she had speedily regained a great measure of calm, but it was judged she should be kept under observation. She remained calm until she found that she was under restraint and could not immediately return to her home and then she again became very violent, so that it was at last found necessary to remove her to another part of the building. Here she recognised that she was among people who were definitely insane and cried out as before, "If you think me mad you shall see what it is like to be mad," and then fell into a condition of katatonia. A psychological predisposition was not enough in itself to cause a psychosis. In the absence of any mental conflict nothing abnormal might ever be remarked. But it was to be noted that such predisposition tended to produce conflicts and so to establish a vicious circle of disease. Only when the patient finds that he cannot help himself, and that nobody is able to help him, does he become panic-stricken and so insane.

Treatment of the Psychoses.

Dealing with the treatment of the psychoses, Professor Jung said that it was perhaps too soon to give an opinion on the value of psychotherapy. Most of the cases which he had explored by analysis had been much too complicated for him to deal with them in the course of a single lecture. He had, however, met with one or two more simple cases, and one of these he related in considerable detail. The case in point was that of a girl, quiet and retiring by nature, who quite suddenly developed symptoms of mental disorder. She said that she spoke with God and with Jesus about war and peace and the sins of men. When seen by Professor Jung she was entirely unemotional, and exhibited no curiosity concerning her visitor or the nature of his visit. She admitted having had these conversations, but could not remember what had been said. When it was urged that she must have heard about matters of great importance and she should have made some notes of what she had learned, she showed a calendar whereon she had simply marked the date when these conversations had taken place. She displayed, in fact, no intelligent interest in the unusual event. She denied having had any religious troubles, but it was learned from the mother that on the evening preceding her hallucinations she had returned from a religious meeting somewhat excited, and had announced her complete conversion. Recognising that taciturnity is a mechanism of self-defence, Professor Jung had proceeded patiently to analyse this case, and in three sittings had traced the girl's history through a recent disappointment in love to a shock which she had received some years previously when at the age of 16 she had been severely punished for encouraging an aged idiot in certain obscene actions. It was at this time that she had become a quiet, rather shy girl, for previously she had exhibited a quite normal display of youthful spirits. This case was, in Professor Jung's opinion, clearly one of dementia præcox of psychogenic origin. The conflict in this instance had led to a complete severance of emotional rapport with the world of men. In a personality where there existed a tendency towards dissociation the same conflict would have caused not dementia præcox but hysteria. It was 10 years since the speaker had first claimed that destructive changes associated with dementia præcox are secondary manifestations of disease, though he did not deny that in certain cases they might be the primary cause of disorder.

The Discussion.

In the course of the subsequent discussion Dr. W. H. B. STODDART said that what criticism he had to offer came from one who was already converted to the psychogenic origin of mental disorders. Certain organic changes had, however, been observed in connexion with dementia præcox which could not be overlooked. General paralytics whose disease was unquestionably organic in origin did react very markedly to environment. He was not convinced that the cases which Professor Jung described were all of the kind which is generally known as dementia præcox in this country.

Dr. HENRY HEAD questioned whether such a disease as dementia præcox really existed. There were cases which began in the classical way and then became atypical—that is to say, they recovered. In any case, it was the mental condition which was of importance rather than the nomenclature. A disease might have a psychogenic origin in some cases and an organic origin in others. This was clearly the case in exophthalmic goitre, whose occasional psychogenic origin had been clearly demonstrated by the recent air-raids.

Dr. WILLIAM BROWN, speaking as a psychologist, expressed his great indebtedness to Professor Jung for his stimulating address. He emphasised the need for a prolonged investigation into the synthesis of mental disorders, quoting cases from his own experience, including one of disorientation which had ultimately yielded to analytical treatment only when a memory dating from the second year of life had been recalled. The question of the possible psychogenesis of epilepsy was also raised in the course of the discussion.

Professor JUNG, in replying, stated that in cases of major epilepsy psycho-therapeutic methods were of little success.

Reviews and Notices of Books.

The Pituitary. A Study of the Morphology, Physiology, Pathology, and Surgical Treatment of the Pituitary, together with an Account of the Therapeutical Uses of the Extracts Made from this Organ. By W. BLAIR BELL. London: Baillière, Tindall, and Cox. 1919. Pp. 348. 30*s.*

DURING the last two decades much has been written about the pituitary gland, but still much remains to be done ere we can say much definitely about its functions and inter-relations. Dr. Blair Bell's own experimental work, begun in 1906, was primarily undertaken to elucidate the relationship of the pituitary to the female genital functions and to determine the physiological and therapeutical importance of extracts made from this organ. It soon became evident that such studies, to be profitable, must be based on a comprehensive investigation of the morphology, physiology, and pathology of this gland and its relations to metabolism in general and to the other endocrine glands and those that form hormonopoietic secretions. The outcome of such research is the splendidly illustrated volume under review.

The text is divided into four parts. The development, anatomy, histology, and comparative anatomy are set forth in Part I. (pp. 3–78). The scientific study of the pituitary began in 1838, when Rathke described the origin of the hypophysis from the primitive alimentary canal. We cannot follow the author into the many details of the comparative anatomy of the pituitary. Suffice it to note that in all vertebrates higher than the elasmobranchs there is a definite pars nervosa. Extracts made from this structure are active in all respects.

Part. II. (pp. 79–214) deals with the physiology of the gland and the methods for the investigation of its functions. Certain physiological states are associated with marked changes in the pars anterior. In pregnancy, both in animals and women, this part enlarges—there is an increase in the degree of eosinophilia or by chromophobia ("pregnancy cells")—the essential change during pregnancy is towards greater activity. Hibernation—e.g., in hedgehog and dormouse—also produces striking histological appearances, both in the epithelial elements of the partes anterior and intermedia—the secretory cells of this organ. In the pars intermedia vesicles with hyaline (? colloid) contents are almost always found, and may represent its normal secretion. Herring found "hyaline" bodies in the pars nervosa, derived, he thinks, from the pars intermedia which pass via the infundibulum into the third ventricle, and so into the cerebrospinal fluid. The author does not agree with this view. He thinks that the cells of the pars intermedia produce the pressor substance which he calls "infundibulin," and that this secretion and that of the posterior lobe are taken up by the blood stream. Therapeutically the most fruitful results seem to be obtained by intravenous injection of extracts of the organ as a whole or of its individual parts. Next the author deals with the effects of destruction and partial or total removal of the gland with the operative technique, describing a large number of his own experiments, and others also on separation and compression of the stalk. The author agrees with Paulesco and Cushing that total extirpation or removal of very large portions of the pars anterior is fatal, also that the removal of the pars posterior produces no symptoms. The author also finds that the genitalia not only do not atrophy, but continue to develop in the young female after removal of this portion of the pituitary. He differs from Cushing in finding that in none of the cases in which portions of the pars anterior were removed did dystrophia adiposogenitalis—with its lowered blood pressure and sugar tolerance—supervene. This syndrome, however, occurs after compression and separation of the infundibular stalk. The author reconciles these diverging views by assuming that this syndrome is primarily produced by insufficiency of the pars anterior, and that the only sure way to effect this is to interfere with the blood-supply. The inter-relations of pituitary activity with that of the thyroid and ovaries is fully dealt with.

Part III. (pp. 215–300) deals with disorders associated with the pituitary and their treatment. The author deals with hyperpituitarism and acromegaly, and describes the cases which he has treated; also with hypopituitarism, which is usually not manifested until the child is growing up. The types before and after puberty are described and illustrated, including dystrophia adiposogenitalis. The surgical treatment of pituitary disease is fully dealt with and admirably illustrated.

Part IV. (pp. 301–329) deals with the therapeutic uses of pituitary extracts for which there are as many names as trade firms manufacturing them. The extracts used were made from the whole gland (pituitarin), pars anterior (hypophysin), pars posterior (infundibulin). The preparations are made as dried or liquid extracts. The former are given by the mouth, but infundibulin is given intramuscularly; this should be done with caution. The indications for their use are carefully noted and special attention is given to the use and pressor effects of infundibulin in shock, collapse, sepsis, serum-sickness, spasmodic asthma, chronic asthenia with low blood pressure, and in obstetrical cases—in which latter its uses and contra-indications are specially described. The author gives the results of his experience in the use of these extracts in other diseases, but they do not seem to be very encouraging. He says:

"The most notable effects and benefits of pituitary medication are obtained in those cases in which a rapid result is desirable. In such circumstances the extract used is that made from the pars posterior, and its action is exerted upon all the unstriped muscle-tissues of the body."

We congratulate Dr. Blair Bell on the success of his endeavour to lift a corner of the veil that still enshrouds the secrets of the pituitary body. Much work has still to be done before the potentialities are laid bare. Perhaps the author, who has already done so much original work to this end, will, in days to come, reveal to us something more of these fascinating mysteries.

The Practical Medicine Series for 1918. Vol. VII.: *Skin and Venereal Diseases.* Edited by OLIVER S. ORMSBY, M.D., and J. H. MITCHELL, M.D. Chicago: The Year Book Publishers. $1.40. Price of the series of eight volumes, $10 00.

THIS volume is one of a series of eight issued at monthly intervals, covering the entire field of medicine and surgery, each volume aiming at completeness on the subject treated for the year prior to publication. The aim is commendable and well realised in the present volume on Skin and Venereal Diseases. The amount of information it contains is large and it is presented in a stimulating manner. Due attention is given to the sociological, as well as to the purely clinical aspect of venereal disease. This is evidenced by the sections on Venereal Disease contracted in the Army, and the Teaching of Syphilis. Under the heading of Gonorrhœa there is an interesting note on phlebitis of the deep dorsal vein, a subject to which little attention has been devoted. An attractive feature is the criticism offered by the editor on the various statements enunciated in the text.

The Ophthalmoscope: A Manual for Students. By GUSTAVUS HARTRIDGE, F.R.C.S. Sixth edition. With 65 illustrations and four plates. London: J. and A. Churchill. Pp. 152. 6*s.* 6*d.*

THE first half of this book deals with the theory of ophthalmoscopic images and gives practical instruction in the use of the ophthalmoscope, covering largely the same ground as the author's book on Refraction. The second half deals with the normal fundus and a few of the abnormal conditions most usually found. Two coloured plates of varieties of the normal fundus will be found useful by the student, but the illustrations of abnormal conditions might well be improved.

A Woman Doctor: Mary Murdoch of Hull. By HOPE MALLESON, B.A. With a Preface by L. B. ALDRICH-BLAKE, M.S., M.D. Lond. With portrait illustrations. London: Sidgwick and Jackson, Ltd. 1919. Pp. 231. 4*s.* 6*d.*

THE life of a good physician is always worth recording for the sake of the medical generations to come. Many students—and especially the women students—will find inspiration in the story of Mary Murdoch's life. But we feel with Dr. Aldrich-Blake that this biography deserves a recognition beyond that of the medical profession. Her insight into human need and her rich possession in the fruits of human

happiness qualify this busy practitioner as an example to all who are striving for a higher conception of citizenship in the world. The biographer has wisely allowed Mary Murdoch to speak very largely for herself, and, indeed, no art could improve upon the transparent sincerity of her finely written letters. Collected in an appendix are to be found also some of her enthusiastic, yet well-balanced lectures and addresses, together with obituary notices published at the time of her death, and amongst these last the one which appeared in our columns on April 1st, 1916. We can well believe that the people of Hull still mourn and still miss their beloved doctor.

A Handbook of Medical Jurisprudence and Toxicology. By WILLIAM A. BREND, M.A. Camb., M.D., B.Sc. Lond., Lecturer on Forensic Medicine, Charing Cross Hospital. Third edition, revised. London: Charles Griffin and Co., Ltd. 1919. Pp. 317. 10*s.* 6*d.*

THE third edition of Dr. Brend's useful little book has been enlarged and brought up to date, the chapter on insanity and other abnormal mental conditions having been entirely rewritten. Both this chapter and the preceding one on the forms of insanity are as good as can be expected in so small a space. The section on insanity and criminal responsibility, dealing with the history and application of the M'Naughton ruling, is particularly clear and interesting. The book is essentially a convenient work of reference, and if read as such in connexion with law cases of current interest will prove of value alike to the general practitioner and to the medical student.

JOURNALS.

The Journal of Physiology. Edited by J. N. LANGLEY, D.Sc., F.R.S. Vol. LII., No. 6. Cambridge University Press. 1919. Pp. 391-474. 9*s.*—The Rate of Diffusion of Gases through Animal Tissues, with some Remarks on the Coefficient of Invasion, by August Krogh. It would seem that the supply of oxygen to cells has never been systematically investigated hitherto. The author describes fully his series of ingenious experiments. The diffusion constant for a gas through a substance is defined as the number of c.cm. (0° C. and 760 mm. Hg) penetrating through 0·001 (1 μ) thickness and 1 sq. cm. surface per minute when the pressure difference is one atmosphere. The diffusion constant for oxygen through animal tissues increases with increasing temperature—about 1 per cent. per degree, taking the rate at 20° as unity. Diffusion of gases through animal tissues is much slower than through water or gelatin. The absolute diffusion constants for oxygen at 20° are: water, 0·34; gelatin, 0·28; muscle, 0·14; connective tissue, 0·115; chitin, 0·013; indiarubber, 0·077. The "invasion coefficient" for oxygen into water is many times higher than the "determinations" hitherto made would indicate.

The Number and Distribution of Capillaries in Muscle, with Calculations of the Oxygen Pressure-Head Necessary for Supplying the Tissue, by August Krogh. To utilise the foregoing data it was necessary to know further the rate at which oxygen is used up by the tissue in question, and the average distance which an oxygen molecule has to travel from a capillary into the tissue before entering into chemical combination. As the capillary arrangements in striped muscle are fairly regular, this tissue was chosen as the basis for study. To this end blood-vessels of certain muscles in different animals were injected. It was found that in striated muscles the capillaries are arranged with such regularity along the muscular fibres that each capillary can be taken to supply a definite cylinder of tissue, the average cross-section of which can be determined by counting the capillaries in a known area of the transverse section. The number of capillaries per sq. mm. of the transverse section of striated muscle appears to be a function of the intensity of the metabolism, being higher in small mammals than in larger forms. The necessary oxygen pressure-head deduced from the total number of capillaries is in all cases extremely low.

Influence of Saprophyte Bacteria on Oxidation in Higher Animals, by I. Kianizin. (Fifth series.) This is a short and interesting paper.[1] (1) The Respiratory Response to Anoxæmia; (2) The Effect of Shallow Breathing, by J. S. Haldane, J. C. Meakins, and J. G. Priestley. As to (1) it is known that ordinarily the respiration is regulated with the utmost delicacy in correspondence with the CO_2 tension of the blood passing through the respiratory centre, and that the centre actually responds to increased hydrogen-ion concentration. The apparatus used is described. In each case the subject of the experiment was sitting at rest while breathing from the apparatus. Records were taken with each variation of the composition of the air breathed—e.g., 3·82 per cent.—4·29 per cent. CO_2; other observations were made on altering the proportion of oxygen in the inspired air. It was found: 1. The respiratory response to anoxæmia is in three stages: (*a*) Increased depth of respiration and increased ventilation per minute owing to lowered CO_2 threshold; (*b*) periodic breathing unless the anoxæmia is considerable; (*c*) frequent and correspondingly shallow breathing. 2. Excess of CO_2 (increased hydrogen-ion concentration) causes a considerable and persistent increase in depth of respiration and relatively slight increase in frequency. This response is in marked contrast to the response to want of oxygen. 3. The maximum increase in lung ventilation is obtained when excess of CO_2 and anoxæmia are both present. As to (2), shallow breathing, there are two theories as to the harmonising of the regulation of respiration with the metabolism of the body—viz., (*a*) that it is a matter of reflex nervous control; and (*b*) that it is a chemical regulation. Investigations showed that there is a distinct connexion between the nervous control and the chemical control. The authors' investigations were carried out on men suffering chronically from the effects of gas poisoning and from a group of symptoms known as D.A.H., "soldier's heart," "irritable heart," "effort syndrome," attention being given to the regulation of the depth of respiration, more especially to the effects of shallow breathing. "Irritable heart" is characterised by breathlessness on exertion, rapid pulse, fainting attacks, giddiness, exhaustion, lassitude, headache, irritability, &c. These patients invariably show a remarkable type of breathing, which is rapid—20 to 60 or more per minute—and shallow—250 to 350 c.cm.—and on exertion the rate increases very abnormally, while the increase in depth is abnormally small. Their alveolar CO_2 is abnormally low. The patients are like a normal individual at high altitudes, where the diminished oxygen tension of the inspired air produces the same series of defects. All showed shallow rapid breathing. The concertina-like apparatus used for regulated limitation of the air inspired at each breath is described and by it records of rate and depth of the respirations were also obtained. It was found that shallow breathing caused unequal ventilation of the lungs, and this in turn produced anoxæmia and consequently periodic respiration and other symptoms. As to the effect of posture on the type and rate of respiration, the recumbent position is normally associated with slowing and deepening of the respiration, and if the deepening is prevented symptoms of anoxæmia are produced. Similar effects on the respiration were produced by abdominal and thoracic constriction—e.g., by use of corsets. These and other observations are regarded as affording an explanation of orthopnœa. In any condition such as bronchitis, asthma, and emphysema, in which the even distribution of the air in the lungs is hindered by local narrowing of the bronchi or local impairment of the lung elasticity, imperfect oxygenation of the mixed arterial blood must tend to be produced in the same way as in shallow breathing.

The Physiological Action of Extracts of the Electrical Organs of the Skate (*Raia clavata*) and Torpedo (*T. marmorata*), by P. T. Herring. Extracts of the fresh organs made with Ringer's fluid were used, and their effects tested on the sartorius of the frog, on mammalian blood pressure, and volume of some organs. Electrical organs do not contain a hormone capable of influencing the contraction of cross-striated muscle. The extracts showed no special effects upon smooth muscle, cardiac muscle, blood pressure, or kidney secretion.

The Supply of Oxygen to the Tissues and the Regulation of the Capillary Circulation, by August Krogh. Direct observations by transmitted and direct illumination were made on the capillaries of the muscles of the tongue of deeply narcotised frogs, and also on other adjacent muscles, and on the muscles of urethanised guinea-pigs by reflected light. Capillaries are not mere passive tubes with the blood flowing through all of them at rates which are determined by the state of constriction or dilatation of the corresponding arterioles. Observations by reflected light on the resting muscles of frogs and guinea-pigs showed that most of the capillaries are in a state of contraction and closed to the passage of blood. By tetanic stimulation of the muscle or by gentle massage a large number of capillaries are opened up. They can be observed to contract again afterwards. In spontaneously contracting muscles a large number of capillaries are likewise opened. The average diameter of the open capillaries in resting muscle is much less than the average dimensions of the red corpuscles, which become greatly deformed during their passage. In working muscles the capillaries are somewhat wider. The oxygen pressure in resting muscles is, sometimes at least, very low, but in working muscles it approaches very near to that of the blood. The capillaries are not merely passively dilated by blood pressure, but constantly perform active variations in calibre. Clinical hyperæmia and anæmia are due mainly to

[1] A summary of previous work will be found in the Journal of Physiology, I., 1916.

changes in the calibre of capillaries and the number of open capillaries. The arterio-motor and capillario-motor systems seem to act in opposite directions.

This is a very interesting volume.

Studium. Revista di Scienza Medica. June, 1919. Pp. 40. Naples: Corso Umberto I. 154. Price 2 lire.—After three years of cessation owing to the war the publication of this monthly periodical has been resumed under the editorship of Dr. Tommaso Senise. We cordially welcome the re-issue with a passing tribute to the artistic design on the cover, with the inscription of "Scientia Lux Lucis," which recalls the style of Walter Crane. The new number contains an editorial review of the literature of the influenza epidemic, with special reference to articles by Trémolières and Rafinesque in the *Presse Médicale* of last February, by Professor J. Boni in *L' Ospedale Maggiore*, Dr. E. Ruggieri in the *Riforma Medica*, F. Schuffer in the *Rivista Critica di Clinica Medica*, and others.—Among other items one of the most important is the report by Professor Leonardo Bianchi to the After-war Commission, on the Biophylaxis and Prophylaxis of Neurosis and Psychosis. In this report he urges the necessity of modifying the Italian law of 1904 concerning insane people and asylums. This law enacted that reception into an asylum was to be limited to those who were a danger to themselves or to others; it was a measure of public safety, not a conception of treatment. The insane, the report insists, must be treated under all circumstances and not only when they are dangerous; the estimate of public safety emanates from a society saturated with bureaucracy from which the social scope of treatment is banished, to say nothing of that of educating the weak-minded.—Professor A. Cardarelli contributes a clinical lecture on Severe Intercostal Neuralgia Symptomatic of Aneurysm and New Growths, and the editor has an illuminating paper on a New Method of Investigating the Functions of the Central Nervous System. This method consists in an experimental production of ischæmia in different areas of the brain by ligature of the arteries supplying those areas.—In the section devoted to Reviews, the more modern methods of treating tuberculosis are dealt with, notably that of Lo Monaco, by injections of saccharose.—There are also many extracts from current medical literature, notices of recent books, and general news. The *Studium* has now reached its ninth year of existence and we wish it every success in the future.

Reports and Analytical Records
FROM
THE LANCET LABORATORY.

UMBROSE.

(ALLEN AND HANBURYS, LTD., 7, VERE-STREET, CAVENDISH-SQUARE, LONDON, W.1.)

THE "barium meal" used in radiological practice should, of course, be quite insoluble in water or acids, as the soluble barium salts are highly poisonous. This means that only the pure insoluble sulphate should be used for the purpose when barium is substituted for bismuth. There is no difficulty in obtaining quite pure barium sulphate free from soluble salts, as is shown to be the case with "umbrose." Shaken for several hours with dilute hydrochloric acid the filtered fluid, according to our examination, showed no trace of barium at all. This simple test, it seems to us, should always be carried out before using the preparation for radiological examination, as serious accidents have arisen either through the sulphate being contaminated with soluble barium salt or through the substitution of the carbonate or even sulphide. Such cases have been reported in our columns. Umbrose is mixed with a certain proportion of convenient pabulum—e.g., cocoa, arrowroot, dried milk—and leaves on ignition a pure white residue of barium sulphate, amounting, according to our analysis, to 74 per cent. A reliable shadow-meal is thus presented.

OMNOPON-ATRINAL "ROCHE."

(HOFFMANN-LA ROCHE CHEMICAL WORKS, LTD. (SWITZERLAND), 7 AND 8, IDOL-LANE, LONDON, E.C. 3.)

Containing the alkaloids of opium in their entirety and in a soluble form, omnopon has recently been combined with atrinal, a sulphuric ester of atropine (not the ordinary sulphate), as a preliminary and adjunct to narcosis by inhalation. Claims are made in favour of its advantages compared with the morphine and atropine sulphate combination, on the grounds that it is less toxic than atropine, its paralysing action on the pneumogastric is less pronounced, while it avoids the increased blood pressure following the use of ordinary atropine salts. It is also stated that it has no unfavourable effect on respiration. The combination is an interesting one and the claims made are of importance. Each ampoule contains 1·1 c.cm. of fluid, representing 0·02 g. omnopon and 0·001 g. atrinal.

CHELTINE FOODS (MILK AND MALTED AND STRICT DIABETIC).

(THE CHELTINE FOOD CO., CHELTINE WORKS, CHELTENHAM.)

We have received, amongst others, three specimens of the milk and malted foods made by the above company. Nos. 1 and 2 are designed for infant feeding, and No. 3 for invalids and patients with weak digestive function. Our analysis sets out their composition per cent. as follows:—

Milk and Malted Food.	*No. 1.*	*No. 2.*	*No. 3.*
Moisture	5·30	4·35	5·60
Ash	1·70	3·05	1·75
Fat	7·94	12·48	7·88
Protein	14·11	17·00	11·27
Sugars	14·85	22·30	12·00
Starch and dextrin	56·10	40·82	61·50
Total matters soluble in cold water	34·25	36·75	26·50

Food No. 1 is intended for infant feeding up to the fifth month, when it is replaced by food No. 2. In each case the food is directed to be prepared with diluted cow's milk. It will be noted that No. 2 is richer in all food materials, fat, protein, and sugar, than No. 1, from which it may be fairly inferred that more milk is used in this case. The conversion of starch by malt is not complete in both cases, but a greater conversion is shown in No. 2. Food No. 3 shows still more unconverted starch and dextrin, which, however, are readily dissolved or assimilated as the result of partial digestion with active malt. In addition, we have received two foods described respectively as (4) diabetic strict flour and (5) diabetic strict food. The main question, of course, in regard to these latter foods is the amount of sugar they are capable of yielding on hydrolysis. The results obtained in our experiments were as follows, in terms of reducing sugar after digestion with acid:—No. 4, 18·16 per cent. and No. 5, 16·00 per cent. They contain, therefore, about a fourth only of the quantity of sugar-yielding substances in ordinary flour, the carbohydrates being replaced largely by assimilable proteins.

ELIXIR YADIL.

(CLEMENT AND JOHNSON, 1A, SICILIAN-AVENUE, LONDON, W.C. 1.)

Reference has been made in our columns[1] to the employment of yadil in influenza when its administration internally appeared to ward off the complications of that disease. Its active constituent is described as trimethenal-allyl carbide, a substance related to the essential oil of garlic. The ordinary preparation has a decided smell and taste resembling garlic, and for those patients who find objection to these characteristics an elixir is now prepared with suitable adjuvants and aromatics obscuring the allylic odour and taste. It is an amber-coloured fluid with sweet and aromatic flavour. Its antiseptic properties are claimed to be established in clinical practice.

SUPEROL.

(K. RAYMENT, 2, BROAD STREET-PLACE, BLOMFIELD-STREET, LONDON, E.C. 2.)

Chinosol will be barely familiar under the name of "Superol," which is now being imported into this country from the Amsterdam Superphosphate Works by the above agent. A good deal of work has been done in regard to determining the germicidal value of chinosol, and while in some directions it compares unfavourably with other antiseptics, it possesses certain advantages of its own. Those whose experience with its application was satisfactory and who, through the war, were unable to get supplies, as it was exclusively produced in Germany, may be interested to know that its manufacture has been undertaken by the above company under the name of "Superol." It is identical, according to our examination, with chinosol, a combination of potassium sulphate with oxy-chinoline sulphate, the base being prepared by the oxidation of nitro-benzene and aniline.

[1] THE LANCET, March 15th, 1919, p. 440.

THE LANCET.

LONDON: SATURDAY, JULY 19, 1919.

The Federation of Medical and Allied Societies.

IT will be remembered that at a conference between the Medical Parliamentary Committee and the representatives of other allied organisations held in May last certain resolutions were come to which were published in THE LANCET the following week.[1] The resolutions provided for the constitution of a permanent body with various duties towards the medical profession and towards the public, while the drafting of a financial scheme under which the work would be done was left to the existing committee, acting as a provisional body with the responsibility of making a report. The report, it was agreed, would be submitted to the representatives of the whole constituent bodies, and being approved, a new executive would come into being, when all the preliminary stages might be considered over. That was the project and so much has now been done. The Medical Parliamentary Committee has been reborn in what it is hoped will be a permanent shape; it has been renamed; its support for the future is under actual consideration, and it yet has to justify its existence by its works. Such is the outcome of the meeting held at the College of Ambulance last Friday, when the representatives of 47 medical and allied societies met the provisional Medical Parliamentary Committee, heard their report on the future constitution, and in the main adopted their scheme.

For reasons which seemed sufficient to the majority of those at the meeting, the Medical Parliamentary Committee now takes to itself the clumsier but more definite name of British Federation of Medical and Allied Societies, a brief discussion on this alteration of title answering an eternally old question by replying that "British" can be used as an adjective connoting all our Irish interests and all those of our Dominions over the seas. Those who look at the resolutions passed at the large meeting in May—and we hope that many will do so—will allow that for the rest the scheme, which has now been adopted, for carrying on the Federation under a change of name, and under some variance of scope owing to the multiplication of interests, has throughout the same general idea, and that this idea has prevailed since, at the meeting of the medical profession in Steinway Hall in October last year, the Medical Parliamentary Committee came into existence. At that first meeting Dr. CHRISTOPHER ADDISON moved a successful resolution to the effect that, "in the interests of national health it is essential that the considered views of the medical profession should be voiced by representative medical men in the House of Commons." At the meeting last May the formation of a permanent medical committee was agreed upon by general resolution, having for its objective to supply expert information on health questions to medical Members of Parliament, to warn the bodies constituting the committee of impending legislation affecting such questions, to facilitate communication between any of those bodies where they were particularly interested, and, lastly, to assist in increasing medical representation in Parliament. The story is one of natural evolution. The stage has now been reached when, to carry out this programme, an executive has been elected and plans have been formulated for raising the necessary funds. Finance, as ever, lags behind, and while the meeting last week recognised the merits of the scheme proposed by the Medical Parliamentary Committee for financing the Federation in the future, discussion of the subject in detail is promised.

So much for what is, and while past experience of unified movements within our ranks makes optimistic prophecy risky, we see no reason why the new Federation should not have before it an immediately and widely successful career. Of course, if the Federation is not supported it will not be a Federation, and will effect nothing; equally, of course, those who decide to join the movement *only* when it is successful may in this case find themselves with no movement to join. But there is so much work ahead of the new Federation, and so real and wide a feeling that this work should be done, that we refuse to believe that any apathy, at this critical stage, will be allowed to nullify the strenuous efforts of the past six months.

[1] THE LANCET, May 10th, p. 808.

Hack v. Hack and Munden.

Mr. M. M. MUNDEN is to be congratulated upon the verdict of the jury in the unsuccessful petition for divorce in which he was cited as co-respondent by Mr. H. S. HACK, the husband of one of his patients. The evidence in the case has been reported in unusual detail, and it was evident that the nauseous story told by the respondent and her maid, together with the letters produced by the latter, could yield no verdict other than that returned. This was made all the clearer when Mr. MUNDEN himself had been in the witness-box and when his evidence had been corroborated by his wife. The story which had to be met was one lacking in practically all those elements of probability which are usually present in the accounts of alleged conjugal infidelity laid before the divorce court. Mrs. HACK was the patient of Mr. MUNDEN from May, 1913, to the autumn of 1917, and she was, as he fully recognised, suffering from alcoholism and hysteria. He also attended her for more than one miscarriage. According to Mrs. HACK, he seduced her in the drawing-room in 1914, and from that time onwards committed adultery with her on various occasions under the cloak of professional attendances, for

which, in fact, he charged as such. On one of the dates assigned to these acts Mrs. MUNDEN was waiting outside the house in the motor-car, in which she frequently accompanied her husband on his rounds. This in itself would be a story of unusual depravity and recklessness on the part of a medical man who had himself been recently married, whatever might be the physical or mental condition of the patient with whom he was intimate. When it is remembered, however, that Mr. MUNDEN was attending Mrs. HACK for alcoholism and hysteria, which was not in dispute, it will be seen at once that only the strongest proof of infatuation in no common degree on his part could render the allegations credible.

Folly and imprudence have limits even in those rendered blind by passion to the likelihood of such a woman betraying her lover, but in the case of Mr. MUNDEN and Mrs. HACK there was not a tittle of evidence of even the most casual friendship, or the most ordinary social intercourse. That he visited his patient as a medical man at intervals was common ground, and no witness on behalf of the petitioner attempted to prove anything more. Nor was there even anything to suggest that Mr. and Mrs. MUNDEN did not live together as a perfectly united married couple. In these circumstances it was only natural that Mrs. MUNDEN should be able to support her husband in his statement that he was only absent for the period necessary for a professional visit on a night when Mrs. HACK and her maid swore that he spent at least two hours in the bedroom of the former. In the same way the doctor's wife could state to a material extent what took place on another occasion when her husband and herself were interrupted at dinner by a visit from Mrs. HACK, who was taken by him into the surgery and afterwards got rid of. There was a singular absence of independent testimony from the whole case. Among the facts referred to, however, were the damning letters produced by the maidservant, to whose custody the respondent had entrusted them. They were written to Mrs. HACK by other men than the co-respondent, in terms that will have been noted by all who read them, and among them was no line of writing from Mr. MUNDEN. In short, the co-respondent, so far as the evidence went, had never sent to the respondent anything more incriminating than a prescription; and he will have the heartiest sympathy of all in the position in which he found himself placed.

Medical men know well that the case of HACK *v.* HACK and MUNDEN is not an isolated one, but an example of a class. It is a rare example of what may occur, but by no means without parallel. It is a danger which has to be faced by members of nearly all branches of the medical profession, that at any time a woman with whom they have been alone may make against them a charge of undue intimacy or of improper conduct of some kind without any ground whatever for doing so. There is no absolute safeguard against such charges, nor, of course, can we say that on all occasions when a medical man sees a female patient alone he ought to have a third person present. This would be a counsel of perfection which in practice would not be possible of fulfilment. Precautionary steps may be taken in cases where symptoms displayed by the patient point to their being desirable, but always the principal safeguards for the doctor would appear to consist in confining the interview to the limit of time necessary for the matter in hand, and the keeping of strict records made with the least possible delay, which should contain all essential details of the patient's condition with the treatment recommended. The ethical rule which restrains a medical practitioner from discussing even with his wife the diseases or idiosyncrasies of his patients deprives him of a limited form of protection which he might otherwise have, this being especially so when there is no professional colleague with whom to discuss any salient points in the case or in the demeanour of a patient. Another way of avoiding risk is to refuse attendance, but it is a dangerous method for a young doctor to adopt—it does not improve his practice, and might lead to his being asked to formulate his reasons for his unusual conduct. A practitioner cannot be blamed for continuing his attendance in risky circumstances any more than a barrister can be blamed for continuing his advocacy on behalf of a client of whose probity he feels doubtful. The medical man will, however, exercise prudence and care in future attendances on such a patient, confident in his own integrity and honour, and not without some faith in the time-honoured maxim which ascribes ultimate victory to truth. To join one of the defence societies is absolutely necessary for the medical practitioner, and we congratulate the Medical Defence Union on securing the complete acquittal of their member from a ruinous charge.

The Conditions of Asylum Medical Service.

THE Asylums Committee of the London County Council has just presented its report to the Council on a revised scale of remuneration and other improvements in the conditions of service of the assistant medical officers at the Council's mental hospitals. It may be recalled[1] that shortly before the war the discontent with their position felt by asylum officers throughout the country resulted in a movement for association to protect their interests and advance the status of asylum service. In May, 1914, a petition was presented by the assistant medical officers of the London asylums to the County Council asking for a betterment of their conditions of service and pay. A deputation then received explained the difficulty experienced by the Council in obtaining the staff for its mental hospitals by adducing three causes for the unpopularity of the service. The specialty of mental diseases is alone in this country in not enjoying a teaching centre; opportunities for advancement in the lunacy service are practically non-existent; and, thirdly, outside the

[1] THE LANCET, 1914, i., 116.

strictly limited number of superintendentships the conditions of asylum service preclude any prospect of living a life of reasonable freedom and responsibility. The deputation suggested that facilities should be given for study-leave sufficient to enable medical officers to obtain a diploma in psychological medicine, and that officers should be seconded for the purpose of holding clinical posts at the Maudsley Hospital, of taking post-graduate courses elsewhere, or of carrying out research work. It was finally urged that permission to marry should not be withheld from any medical officer on the permanent staff after a reasonable length of service.

The war postponed consideration of these suggestions, and now that the matter comes up again for decision the Committee admits that the difficulties have increased rather than diminished, in view of the greater scarcity of qualified medical men and the growing attraction for the medical entrant of other branches of public service. In view of this the Committee proposes a drastic revision of the remuneration scale, the rate of pay for the first assistant being fixed at £700, equivalent to £875 with the present war bonus and percentage additions. His colleagues would similarly look to a salary running up to £755, £650, and £553 respectively in ascending order of seniority. This scale to count for the larger mental hospitals with 2000 or more patients. It is further proposed to remove the restriction upon the civil state of medical officers below the grade of second assistant, and to put them in this respect in the same position as the senior assistant who already finds suitable accommodation provided for him as a married man within the asylum precincts. Sympathetic consideration has been given to the points raised in regard to education, special medical qualifications, and leave, and a further vital change is submitted for the approval of the Council—namely, not to appoint any officer in future exclusively to a single institution, but to leave open the question of transfer from one mental hospital to another.

The time is, indeed, more than ripe for the suggested reforms. The life of the asylum medical officer has in the past tended neither to the efficiency of the service nor to the development of the medical officer's own powers and character. The disabilities in regard to marriage could hardly have been enforced by any authority possessed of human sympathy and social imagination. To the Ministry of Health, under the recent Act, it is lawful to transfer by Order in Council any powers and duties of the Secretary of State under the Lunacy Acts. The London County Council has already, without pressure from above, begun to set its house in order in regard to a proper mental medical service, but it remains to be seen whether the service can become such as it should be, in the interests of staff and patients, without being placed under the Minister who directs the other public health services of the country. The quasi-autonomy of the Board of Control is an anachronism.

Annotations.

"Ne quid nimis."

THE OSLER PRESENTATION.

A DISTINGUISHED company, which included the President of the General Medical Council, the Director-General of the Army Medical Service, and the High Commissioner for Canada, assembled on Friday, July 11th, at the House of the Royal Society of Medicine, to do honour to Sir William Osler on the eve of his seventieth birthday. Sir Clifford Allbutt presented the two large octavo volumes of essays written by pupils, colleagues, and friends in all parts of the British Dominions and America, alluding feelingly to Sir William Osler's leadership in the relief of sickness and adversity, and to the fruitfulness of the marriage of science and letters exemplified in his career, concluding with the words:—

"In these volumes we hope you will find the kind of offering from your fellow-workers which will please you best; immaterial offerings indeed, but such as may outlive a more material gift. As to you we owe much of the inspiration of these essays, and as in many of their subjects you have taken a bountiful part, so by them we desire to give some form to our common interests and affections.

We pray that health and strength may long be spared to you and to her who is the partner of your life; and that for many years to come you will abide in your place as a Nestor of modern Oxford, as a leader in the van of Medicine, and as an example to us all."

Sir William Osler, in responding to the gift, recalled his own vagrant career—as a student in Toronto, Montreal, London, Berlin, and Vienna, as a teacher in Montreal, Philadelphia, Baltimore, and Oxford. Loving the profession of medicine and believing ardently in its future, he had been content to live in it and for it. We may recall his own words spoken 14 years ago in taking leave of his friends in the United States:—

> I have loved no darkness,
> Sophisticated no truth.
> Nursed no delusions,
> Allowed no fears.

In the spirit of equanimity, which he then praised, he has borne success with humility, the admiration of his friends without pride, and has stood the test of sorrow with unflinching courage. The 14 years among us have brought Sir William Osler in full measure the affection of us all.

DEGENERATION AND REGENERATION IN THE PERIPHERAL NERVES.

Professor Onari Kimura, of the Pathological Institute of the Imperial University at Sendai, Japan, has published an elaborate monograph[1] on degeneration and regeneration in the peripheral nerves, with especial reference to non-traumatic cases and experimental beri-beri, embodying the results of a long series of investigations on non-traumatic "neuritis." His researches were conducted on some 20 fowls and pigeons, in which typical "polyneuritis" was produced by feeding on polished rice for varying periods and in varying combinations, fully detailed in the monograph. By way of comparison, some 16 dogs and guinea-pigs were subjected to nerve section with immediate enclosing of the central end in an animal

[1] Mitteilungen a. d. pathologischen Institut der Kaiserlichen Universität zu Sendai, Japan, 1919, erster Band, erster Heft, pp. 1-160.

membrane filled with fresh blood, or the cut ends were placed in apposition in various ways—e.g., in one case they were surrounded by a mass of brain-substance taken fresh from another guinea-pig. The minute histological investigation of a human case of acute tuberculous polyneuritis and of progressive hypertrophic interstitial neuritis (Dejerine-Sottas) was also undertaken. As Professor Kimura intends to deal with the traumatic material in a subsequent communication, his allusions to it are brief, but he points out that regeneration in section cases is different from what obtains in non-traumatic cases, to which he devotes almost the whole of his paper. The pathological changes in the nerves and muscles of birds fed on polished rice are essentially of a regressive-degenerative character. In the muscles simple atrophy and fatty degeneration are the chief changes, but they are not of primary significance, for often within one week of the resumption of normal feeding wasted muscles recover their ordinary volume and apparently also their full functional power. The severity of the anatomical changes in the peripheral nerves, in experimental "rice-neuritis," bears no constant parallel relationship to the clinical symptoms. In their essentials they consist of a pure degeneration; in no instance did Professor Kimura find any sign of alterations of an inflammatory nature. Degeneration does not by any means always commence at the periphery of the nerve fibres; on the contrary, it may appear anywhere along the course of a nerve, sometimes at different levels in different fibres of the same nerve. Further, normal and degenerated fibres are seen side by side. The suggestion is made that experimental "neuritis" is a general affection of the nervous system, with local lesions at sites that are somehow predisposed. Lower extremities are much more usually affected than upper, with special incidence on the peroneal nerves. The first recognisable sign of degeneration is in the axon, frequently noted when the myelin sheath is still intact, nor does it necessarily progress distally by a mere Wallerian process, for the morbid agent may attack spots beyond the original lesion. Once the nerve fibre gets to the stage of complete myelin degeneration no axon can be found in it; in fact, the latter disappears before any complete break-up of myelin. The myelin fragments are, according to all appearance, absorbed in situ after being dissolved or otherwise chemically modified by some (? fermentative) function of the cells of the sheath of Schwann, or stream in this dissolved state towards lymph and venous channels; in the human cases, however, there was evidence of direct phagocytic activity for the scavengering of some at least of the degenerative products. When a fibre in a state of complete myelin disintegration is seen to contain within its neurilemma an axon, such axon, according to Professor Kimura, is invariably a new formation—i.e., a regenerated axon. To the problem of regeneration in non-traumatic "neuritis" he devotes an important part of his research. His view, supported by much histological evidence, is that the way is paved for the new axons by protoplasmic prolongations of the cells of the neurilemmal sheath, that these link up to form more or less "solid" protoplasmic paths, filling the otherwise nearly empty fibre. In or through this protoplasm the new axon makes its appearance, either by direct outgrowth from the proximal end, or—a very important alternative—by differentiation from this ribbon-like protoplasm, beginning at the end nearest to the old axon-stump, and spreading link by link peripheral-wards. It is commonly a simple, smooth, delicate axon, with neither whorl nor end-bulb formation on its course, thereby differing from what is seen in the majority of cases of regeneration after trauma. Much importance in this matter is attached by the author to the intactness of the neighbouring connective tissue supporting the nerve. For the equally interesting question of the origin of the new myelin formation these researches of Professor Kimura unfortunately do not serve; he merely indicates the possibility of part of the protoplasmic bridges within the fibre sheath being allocated to that purpose. It is to be regretted, also, that he modestly considers his experimental material too meagre for any exhaustive contribution to the problem of the pathogenesis of beri-beri, or "rice-neuritis," and contents himself with a review of the literature and present state of knowledge on this vexed question. He remarks with justice that little enough attention has been paid to the actual pathology of the deficiency diseases, and is not clear that the "monophagismus" group of beri-beri, scurvy, Barlow's disease, and pellagra contains conditions essentially alike in their pathogenesis. Whether "ein schädliches plus" beyond mere partial starvation is essential Professor Kimura does not allow himself to say, but he quotes with approval the opinion of Eijkman—which for that matter had been expressed before—that absence of some essential element in food may allow the development of some nerve poison to which the symptoms are attributable. The monograph is illustrated with admirable coloured drawings, and micro-photographs reproduced in collotype, and there is a very long bibliography.

INSURANCE FOR MEDICAL MEN.

THE Managing Committee of the Medical Insurance Agency met last week and found itself able to make substantial interim allotments, amounting to £455—£125 to the Royal Medical Benevolent Fund, £125 to the Royal Medical Benevolent Fund Guild, £105 to Epsom College Royal Medical Foundation, and £100 to the Royal St. Anne's School. In this way the committee was fulfilling one of its prime objects. For the Agency, when founded 12 years ago with the intention of assisting medical men to obtain the best terms of insurance of all kinds, has from the first kept in mind as one of the chief reasons for its existence the practical aid of the benevolent institutions of the profession. The Royal Medical Benevolent Fund is the most largely benefited of such institutions in the recent distribution, but its record deserves that this should be so, while its offspring, the Guild, is doing most admirable work, the special feature here being the personal interest of individual ladies in the work. It has seemed to the Agency that one of the most practical means it could take to help less fortunate members of the profession was to contribute to the education of children. This it has done by subscriptions to Epsom College, where boys are received on the foundation, and to the Royal St. Anne's School, where girls obtain an excellent education. This benevolent side of the Agency's work has commended it to many members of the profession, though not to so many as might have been expected to resort to it. Last year the total

distributed from the Agency's medical benevolence account was £1002 10s., including contributions of £150 to the War Emergency Fund of the Royal Medical Benevolent Fund, and £100 to the Belgian Doctors' and Pharmacists' Relief Fund. At the same time the insurers received an advantage by the return out of the commissions received by the Agency of certain sums which in 1918 totalled £697. Since the foundation of the Agency £7200 have been returned in this way to insurers, a sum which represents a direct saving to the profession. The Agency is not bound to any particular companies or forms of policy, and is able to advise medical practitioners contemplating insurance as to the best form of policy to suit their particular conditions. The life insurance business conducted through the Agency is considerable, and it is confidently anticipated that as the conditions disturbed by the war become more stable this form of business will largely increase. The insurance of motor-cars is growing into an extensive branch of energy; in spite of the difficulties in the way of motorists created by the war and the shortage of petrol and of cars the number of motor insurances has increased, and experience has proved that the Agency, owing to the amount of business it conducts in this direction, is able to assure to its clients that their claims shall be promptly and generously met. In presenting the financial report the chairman, Dr. G. E. Haslip, was able to speak in the most hopeful terms of the future of the Agency, and mentioned that vacancies, due to deaths of several members of the committee, had been filled by the election of Dr. E. Weaver Adams, Dr. H. A. Des Vœux, Lieutenant-Colonel R. H. Elliot, I.M.S., Dr. R. A. Gibbons, and Dr. R. Langdon-Down.

PENTOSURIA.

THE occurrence of pentoses in the urine is not so rare an event as is commonly supposed. Pentosuria is not necessarily associated with any morbid symptoms, and does not of itself call for any particular treatment; the importance of the condition arises from the fact that its presence may lead to a hasty diagnosis of diabetes, with consequent dietetic restrictions which are unnecessary. Two distinct types may be recognised: (1) the alimentary form, in which the sugar is l-arabinose and the urine rotates polarised light to the right; (2) true or essential pentosuria, in which the sugar is usually i-arabinose and the urine is optically inactive, unless some other sugar is present as well. Alimentary pentosuria is apt to cause mistakes in diagnosis, especially at this time of the year when fruit is being eaten more extensively than at other seasons. The tolerance limit for pentoses is small, about half a gramme, and even in healthy people a surfeit of cherries will cause the appearance of the sugar in the urine. Plums, gooseberries, strawberries, apples, and other fruits in sufficient amount may give rise to a similar result. The amount of sugar excreted is usually small, 0·5 per cent. or under, and as arabinose does not reduce as readily as dextrose the reaction is delayed and is often of a peculiar type. When, for example, the urine is added to Fehling's or Benedict's solution and boiled no change occurs for a time, but after continued boiling the colour of the solution suddenly changes to green, no turbidity occurring even when the heating is prolonged. A small percentage of dextrose or other reducing substance may give a similar result. More characteristic is the orcin reaction, best carried out in the form of Bial's test. 4–5 c.cm. of Bial's reagent (0·5 gr. orcin, 250 c.cm. fuming hydrochloric acid, sp. gr. 1·195, and 12 drops of liq. ferri perchlor.) are heated to boiling in a test-tube and 1 c.cm. of the urine added; on standing a green-blue colour develops when a pentose is present. If the solution is cooled, extracted with amyl alcohol, and the extract examined with the spectroscope, it shows a band between the red and yellow (C and D). Glycuronic acid may give a similar reaction, but it also gives Tollen's naphthol-resorcinol test. The most conclusive evidence is furnished by preparing the diphenylhydrazone with a melting-point of 216–218° C. for the l-arabinose derivative and 204–205° C. for the i-arabinose compound, and the parabrom-phenylosazone which melts at 196–200° C. in the case of l-arabinose and 200–202° C. for the inactive form. As pentoses are not fermented by yeast the reducing power of the urine in cases of pure pentosuria is not impaired by mixing it with yeast and standing in a warm place for 24 hours.

PRACTICAL ISSUES ON THE ALCOHOL QUESTION.

WE welcome the scientific investigation of alcohol with reference to practical issues. No one drinks a dilution of pure alcohol and water, and yet hitherto, whilst interesting evidence has been accumulated, physiological experiments have, in the main, been based not on the actual beverages consumed by the public, but literally on $C_2H_5OH + H_2O$. That formula does not by any means present the story of such beverages as claret, sherry, port, beer, champagne, and so forth, none of which is a mere dilution of pure alcohol, and it is well known that these various alcoholic beverages differ in their effects. The effervescent wine champagne, for example, has a different effect from claret, though both contain the same amount of alcohol. There are important varying factors in the numerous alcoholic beverages consumed by the public which must count in regard to their effects. A mixture of whisky and water, for example, is below the specific gravity of water, whilst wines and beers are above this point on account of the solid matters in solution. Osmotic pressure must therefore vary, and with it the rate of diffusibility of the alcohol.

In an important investigation undertaken for the Medical Research Committee by Dr. Edward Mellanby,[1] bearing on the absorption into, and disappearance from, the blood of alcohol under different conditions, these points find interesting illustration. It is shown that differences in intensity of intoxicating symptoms obtained by taking the same amount of alcohol in one or several drinks depend on the type of beverage drunk and the interval between the drinks. Foodstuffs inhibit intoxication in consequence of their action in delaying the absorption of alcohol from the alimentary canal. The most effective inhibitor is milk, the action of which appears to be dependent to some extent on its fat content. Its specific influence in delaying absorption more than counterbalances its general effect as a fluid, and Dr. Mellanby comments upon the striking differences observed in the effects of a dose of alcohol when given two hours after the consump-

[1] Special Report Series, No. 31. National Health Insurance, Medical Research Committee: Alcohol: Its Absorption into, and Disappearance from, the Blood under Different Conditions. London: Published by His Majesty's Stationery Office.

tion of half a litre of water and after half a litre of milk respectively. In the first case a dog may become incapable of standing or walking, in the latter case it may show no sign whatever of unsteadiness. Whisky is found to be more intoxicating than stout, partly because of its greater concentration of alcohol, and partly because stout contains something which inhibits the absorption of alcohol to some extent. These results are interesting in discussing the factors influencing intoxication. It is found that intoxication is related to the amount of alcohol in the blood and probably to the rate of accumulation in the blood. Dilute solutions of alcohol are less intoxicating than strong solutions containing the same amount of alcohol, the difference becoming more marked the greater the quantity of alcohol consumed and the greater the dilution. These results have an important bearing on the question of what constitutes an intoxicating liquor, a question which is being fought out in the U.S. courts in connexion with the legality of the sale of 2·75 per cent. (alcohol) beer under prohibition. Dr. Mellanby's investigation was confined to the use of dogs as subjects, but the various factors shown to affect the results in a dog are likely to have a corresponding influence in man, and similar experiments so far being carried out on human beings indicate that the results are strictly comparable. There is one difference, however, noted. The hind legs of a dog are the first to show weakness, and it is this which makes it more difficult for a dog to stand still than to walk when intoxicated. In other words, in walking the weakness of the hind legs is compensated for by the front legs and the muscles of the other parts, and collapse prevented. In man the whole support of the body depends upon the legs, and the base of the standing man is relatively much smaller than that of the dog. Consequently, balance is a more difficult matter in an intoxicated man, and therefore unsteadiness is a more predominant feature in the complete picture.

The report is one of the best contributions on the practical side of the question that has been issued, and the evidence that the effect of alcohol is cumulative because its disappearance from the blood is remarkably slow is not the least important observation made—apparently it makes no difference whether a given amount of spirit is taken in one dose or in divided doses at intervals which may extend to two hours.

THE CONSULTATIVE COUNCILS OF THE MINISTRY OF HEALTH.

THE draft orders establishing Consultative Councils under the Ministry of Health for England and Wales are now being issued. There are five of these Councils, four for England and one for Wales. The English Councils are to give expert advice in connexion with: (1) Medical and allied services; (2) local health administration; (3) National Insurance; and (4) general health questions. Each English Council will be composed of 20 members, and the Minister and Parliamentary Secretary to the Ministry will be respectively President and Vice-President. The Welsh Council, with the same ex-officio officers, will consist of 30 members chosen to give advice under all four of the English sub-headings. The period of office is for three years, and during the first three years one-third of the Council will retire by lot, but can be reappointed for one further term of three years. The personnel will consist of women as well as men.

ENCEPHALITIS LETHARGICA.

DURING the past year reports have been received which show that cases with the symptomatology of encephalitis lethargica have occurred in many countries. There appears to be practical unanimity that the disease is to be regarded as distinct from the encephalitic form of poliomyelitis. Many observers are of the opinion that it is a disease allied to poliomyelitis; while others, mainly those who have made a special study of the history of the disease, incline to the view that encephalitis lethargica is associated in some intimate causal manner with influenza.[6] The latter point out that previous recorded epidemics of lethargy have been associated in point of time with epidemics of influenza, and they suggest that an attack of influenza either predisposes the patient to the lethargy or in some unexplained way activates the virus of lethargic encephalitis. The symptomatology of the recorded cases is the fairly constant one which is already familiar to readers of THE LANCET. The various epidemics differ, however, in the severity of the individual attacks, and particularly in the mortality which, in the case of the Australian epidemic, was as high as 70 per cent. The pathological reports on the fatal cases show constant involvement of the basal ganglia and the pons by an encephalitic process, characterised by well-marked perivascular lymphocytic infiltration with occasional venous thrombosis and necrosis of the brain substance. The severe cases show generalisation of this process in the central nervous system.[4] Inoculation experiments were particularly striking in the case of the Australian epidemic. The virus produced typical lesions, not only when inoculated into monkeys, but also on injection into sheep and into a horse and a calf. Herein it differed markedly from the virus of poliomyelitis, to which the monkey alone has been proved to be susceptible.[5] In another group of cases, on the other hand, experimental inoculation produced clinical and pathological evidence that the disease was acute poliomyelitis with an unusual distribution of the lesions.[3] On the whole, it would appear that while the symptomatology of encephalitis lethargica may occur as a result of the lesions of epidemic poliomyelitis, yet there exists a disease sui generis which produces such symptoms as a constant feature, owing to the regularity with which it involves the basal ganglia. Further light on the symptomatology of the disease was thrown by Dr. E. Farquhar Buzzard in his paper read before the Neurological Section of the Royal Society of Medicine on July 10th. In a considerable number of cases which he put on record the initial stage, presenting cranial nerve palsies associated with lethargy, was followed by the appearance of various involuntary movements of the face, tongue, and limbs. The character of these movements was athetoid, with some features strongly reminiscent of chorea, but a general characteristic of all was the absence of interference with the due performance of voluntary movements. In this they resembled the involuntary movements seen in paralysis agitans, and, indeed, in one of the cases described by Dr. Buzzard the aspect of the patient suggested this diagnosis. As is well known, the lesion of Parkinson's disease is localised in the basal ganglia, and cases of disseminated sclerosis in which the patches occur in the same region exhibit sleepiness and drowsiness to a marked degree. It appears, therefore, that lethargy may take its place

among the true localising signs of cerebral lesions. Such being the case, it is to be expected that any disease producing a lesion in this region may cause lethargy. As Sir Thomas Barlow pointed out in the course of the discussion, one of Dr. Buzzard's cases might well have been a case of measles with encephalitis as a complication. So far during this year true encephalitis lethargica has appeared only sporadically, and under such circumstances the separation of a disease with such a complex symptomatology presents great difficulty. Dr. Buzzard indicated the importance of the further development of our knowledge of filter-passing organisms in connexion with diseases in this category.

References.

1. Bassoe, Peter: Epidemic Encephalitis (Noma), Jour. Amer. Med. Assoc., April 5th, 1919.
2. Breinl, A.: Clinical, Pathological, and Experimental Observations on the "Mysterious Disease." A Clinically Aberrant Form of Acute Poliomyelitis, Med. Journ. of Australia, March 16th and 23rd, 1918.
3. Burger and Focquet: L'Encéphalite Léthargique, Archives Médicales Belges.
4. Buzzard, E. Farquhar: Lethargic Encephalitis, Med. Soc. Lond., Dec. 9th, 1918.
5. Cleland and Campbell: Acute Encephalo-myelitis, Brit. Med. Jour., May 31st, 1919.
6. Crookshank: A Note on the History of Epidemic Encephalomyelitis, Proc. R.S.M., 1919, xii., Sec. Hist. Med.
7. Ely: Lethargic Encephalitis, Jour. Amer. Med. Assoc., April 5th, 1919.
8. Shultheiss, H.: Einige Beobachtungen über den Verlauf der epidemischen Grippe bei Kindern, insbesondere über einen Fall von Landryscher Paralyse, Schweitz. Corr. Bl., Nov. 2nd, 1918.

TREATMENT OF ANTHRAX BY LOCAL INJECTION OF SERUM.

IN the *American Journal of the Medical Sciences* for June Dr. Joseph C. Regan and Dr. Catherine Regan have reported a case of anthrax which, in addition to other features of interest, seems to indicate the value of a new method of treatment—the local injection of anti-anthrax serum. A man, aged 26 years, was admitted to hospital on Nov. 21st, 1918, as a case of parotitis. On the 18th, while shaving, he cut himself on the right side of the neck. He lathered soap over the wound with a new shaving brush which he had washed and placed in boiling water. Next day about noon he complained of headache, backache, and pains all over the body. Towards evening the neck became stiff, especially on the right side, so that it hurt him to turn his head. This he attributed to a small pustule which had developed at the wounded spot. During the night he had a chill and felt feverish. On the 20th swelling of the neck was more marked and was tender. On the 23rd he came under observation. His voice was hoarse. The throat was congested. Over the right interscapular region a few moist râles were heard on inspiration. On the right side of the neck, 1½ in. below the angle of the jaw, was a considerable swelling with a pustule about 25 mm. in diameter in the centre, like a vaccination lesion on the ninth day. In the centre of the pustule was a black depressed eschar, surrounded by an elevated white border. At the outer margin of the eschar were a number of small elevations resembling vesicles, which discharged continuously serous fluid. The surrounding tissues were very œdematous. Smears and cultures were taken from the ulcerative surface, exposed by lifting the margin of the eschar, and showed anthrax bacilli. This was verified by inoculation of a mouse. A culture from the patient's blood was sterile. On the 24th, at 10 A.M., 48 c.cm. of anti-anthrax serum were injected into the muscles of the right buttock, and in the evening 10 c.cm. into the indurated tissues around the pustule. From 99° F. at 8 A.M. the temperature rose to 101° at 8 P.M., and returned to 99° on the following morning. This was regarded as a serum reaction. On the 25th the œdema had slightly extended, and the lesion seemed more definitely elevated. 30 c.cm. of serum were injected into the right buttock, and 10 c.cm. into the region around the pustule. On the 26th the inflammation and swelling rapidly subsided. On the 27th the pustule had shrunk considerably and lost its red areola. The most marked swelling was localised in a mass of glands below the angle of the jaw. Twelve c.cm. of serum were injected in their neighbourhood. On the 29th another intramuscular injection of 30 c.cm. was given and the glandular swelling subsided rapidly. Recovery ensued. The anthrax bacillus was cultivated from the shaving brush. Only serum treatment was used. Its success rendered excision of the lesion unnecessary. The local injection of serum does not appear to have been previously tried. The mildness of the attack, despite the situation of the pustule in the neck, is noteworthy.

MEDICAL BOARDS OF THE MINISTRY OF PENSIONS.

MEDICAL practitioners wishing to serve on the Boards of the Ministry of Pensions, and especially those who have had practice and experience in the diagnosis and treatment of war diseases such as trench fever, dysentery, malaria, &c., are requested to communicate with the Commissioner of Medical Services of the Region in which they reside. The names and addresses of the Commissioners and the boundaries of their Regions are given below:—

London and South-Eastern Region: Dr. H. J. Neilson: Hotel Windsor, Victoria-street, S.W. 1. County Boundaries: The City of London and Metropolitan Police Districts, and the counties of Kent, Surrey, and Sussex.

Eastern Region: Dr. T. Basil Rhodes, 80, Westbourne-terrace, Paddington, W. 2. County Boundaries: Norfolk, Suffolk, Cambridgeshire, Oxfordshire, Huntingdonshire, Bedfordshire, Berkshire, Buckinghamshire, Northamptonshire, Leicestershire, Rutlandshire, Hertfordshire, and Essex (except the portion of the two latter included in London and South-Eastern Region).

South-Western Region: Dr. J. Young, 5A, Union-street, Bristol. County Boundaries: Gloucestershire, Wiltshire, Dorset, Somerset, Devonshire, Cornwall, Hampshire, Isle of Wight.

West Midland Region: Dr. E. R. Hill, Queen's College, Paradise-street, Birmingham. County Boundaries: Staffordshire, Shropshire, Herefordshire, Worcestershire, and Warwickshire.

East Central Region: Dr. Gibbs Lloyd, Acting Commissioner, Basinghall Buildings, Basinghall-street, Leeds. County Boundaries: Yorkshire (except the Cleveland district on the north, which is included in Northern Region, Middlesbrough Area), Derbyshire (except district included in Chester (new)), Nottinghamshire, and Lincolnshire.

North-Western Region: Dr. A. H. Williams, 1, North-parade, Deansgate, Manchester. County Boundaries: Lancashire, Cheshire, Isle of Man, and portion of Derbyshire embracing Glossop and New Mills.

Northern Region: Dr. W. Lloyd Reade, 47, Pilgrim-street, Newcastle-on-Tyne. County Boundaries: Northumberland, the town of Berwick, Durham, the Cleveland district of Yorkshire, Cumberland, and Westmorland.

Welsh Region: Dr. Bickerton Edwards, 30, Park-place, Cardiff. County Boundaries: The whole of Wales and Monmouthshire.

Scottish Region: Dr. G. H. Gibson, 59, Cockburn-street, Edinburgh. The whole of Scotland.

Irish Region: Dr. D. A. Carruthers, 41, Upper Fitzwilliam-street, Dublin. The whole of Ireland.

It is understood that the remuneration will be 1 guinea per session of 2½ hours for ordinary members of the Board and 2 guineas per session for specialist members of the Board.

A NATIONAL COLLECTION OF WAR SPECIMENS.

As our readers are already aware, the Council of the Royal College of Surgeons of England, at the request of the Army Council, placed its Museum, workrooms, and staff at the disposal of the Royal Army Medical Corps at an early phase of the war for the purpose of building up a national collection to represent the injuries and diseases suffered by soldiers under modern conditions of warfare. From the conservator's annual report, dealing with the welfare of the Museum during the past 12 months, we learn that altogether 4000 specimens have been received, chiefly from hospitals in France, although a representative series was also obtained from base hospitals in the Eastern Mediterranean. Over 1200 of these specimens have already been examined, mounted, described, and placed on exhibition in the Museum. At the conclusion of fighting plans had to be considered regarding the future of the War Office or national collection: (1) as regards its housing and upkeep; (2) as regards its completion. The future home of the collection remains unsettled, the War Office having no building at its disposal sufficient to accommodate a collection which requires the floor-space of three of the larger rooms of the Museum for its display. As these rooms are now needed for their pre-war purposes, the Council of the College has consented to devote the floor-space and galleries of one room for the display of the national collection until the War Office has determined on its future home and upkeep. Whatever plan may be adopted it is to be hoped that the collection will be placed where it may be available for study by civilian surgeons as well as by officers of the Royal Army Medical Corps—that it may, indeed, form a bond between the civil and military branches of the profession. The main burden of preparing the collection—certainly the most extensive and instructive of its kind ever assembled—has fallen on Professor S. G. Shattock and Mr. Cecil Beadles, and arrangements are now being made, so we are given to understand, between the Director-General of Army Medical Services and the Council of the College to secure the services of these two gentlemen in completing the collection—a task which will entail at least two more years of labour. Not only has the Museum of the College served the needs of our own Medical Service, but also those of Canada, Australia, and New Zealand. Of the 4000 specimens forwarded to the Museum about 1600 of them were collected by the Colonial Medical Services, and these have recently been removed from the Museum to form teaching collections in Canada, Australia, and New Zealand. Thus, in spite of a much depleted staff, the Museum of the College was able to render a considerable service by securing definite and permanent records of our medical and surgical experience of modern warfare. Further, we learn from the conservator's report that the Museum is being gradually restored to its pre-war state, but that it will not be fully open for study until October next. The indiscriminate bombing carried on by the enemy made it necessary to remove all the spirit specimens —some 12,000 in number—to the cellars in the basement of the College, and their return is possible only when the War Office specimens have been arranged in the room now set aside for their display. The opportunity has also been taken of effecting some very desirable alterations in the arrangement of the contents of the Museum. In spite of the war we are glad to note that many valuable donations have been made to the collection, and that researches of value have been carried out. Mr. Alban Doran continues to compile a catalogue of the surgical instruments, which will form a standard history of surgical invention—one which, we hope, the Council of the College may see its way to publish some future day.

MEDICAL AID FOR CROFTERS AND COTTARS.

IN one important section of Great Britain a form of State medical service has been a going concern for a number of years, and deserves the close attention of all those interested in the reconciling of private and State-subsidised practice. The medical service now obtaining in the Highlands and Islands of North Britain is described by the Statutory Board, which has charge of it, as a spontaneous growth combining in certain districts the efficiency of a private or competitive service with the stability of an official service provided by the State. The Board constituted under the Highlands and Islands Grant Act of 1913 for the period of four years has been continued on account of war conditions, and has just presented its fifth report. Of the schemes prepared and approved in 1914 by the Secretary for Scotland only those involving grants to medical practitioners and to district nursing associations have come into effect. The scarcity both of doctors and nurses was naturally enhanced during the year 1918 covered by the present report. The serious situation created by the influenza pandemic was only met by the high sense of individual duty prevailing in the service. The medical service, which has now stood the test of three years' experience, covers 143 practices, nine of which in normal times require the coöperation of two doctors. In spite of depleted staff the year 1918 saw an increase of 7 per cent. in the travelling and of 21 per cent. in the number of visits over the preceding year. We note, however, that the increase is confined to patients coming within the Board's scheme, and is balanced by an almost corresponding decrease in respect of private practice. In point of fact, at the present time about four-fifths of the entire medical service rendered to the crofters and cottars is subsidised or maintained from public sources. In some of the poorer districts the amount of private practice is now almost negligible. Travelling grants enable practitioners to visit distant patients at low uniform fees; these grants in 1918 amounted, in the case of poorer practices, to a sum producing a net income of about £360 a year, and in the aggregate to some £32,000. The nursing service was recently referred to by Mr. Munro, Secretary for Scotland, in reply to a question in the House of Commons. A scheme at present before the Treasury would have the effect of increasing the nurses' remuneration by approximately 30 per cent. on the pre-war figure. The number of nursing associations on the grant list is stated in the report to be 38 and the total number of nurses employed 98, of whom 49 are fully trained. The cost of this service for the year in question amounted to £4000. Partly trained nurses have been perforce accepted during the war years, but some of these have already been replaced by others with higher qualifications, and on the new county (as opposed to the parish) basis specialised schemes

of public welfare are contemplated, in addition to the general nursing work of the area. £130–£135 for a fully trained nurse and £100–£110 for a midwife or nurse with intermediate qualifications are the rates of remuneration suggested by the Board as meeting present requirements. Although the remaining schemes under the Board's mandate have been practically in abeyance during the war, a study of the report will not fail to bring home to the careful student the lesson of what can be attained by a judicious blending of public and private effort.

THE CARRIER AND THE ATYPICAL CASE.

MUCH is to be gained from an extended study of those diseases which tend to appear and to spread in closely aggregated communities. Among such diseases cerebro-spinal fever occupies a prominent place. In the present issue of THE LANCET we publish an article by Lieutenant-Colonel J. Dorgan, R.A.M.C., which raises many points of importance, especially with regard to the administrative methods to be adopted when dealing with an outbreak among a population living under army or institutional conditions. His contention is that the atypical and unrecognised case is the factor of primary importance in the spread of the disease, while the healthy carrier is relatively innocuous. He supports his view with circumstantial and statistical evidence, laying stress upon the acknowledged fact that the healthy carrier is seldom known either to develop the disease himself or to transmit it to others. Proof of transmission is, in the nature of things, very difficult to establish, since the carrier is usually discovered after the case of infection. But the occurrence in an epidemic of atypical infections due to the meningococcus, as adduced by Dr. Dorgan, is closely paralleled by the well-attested occurrence of atypical cases in the course of any considerable outbreak of diphtheria, or, indeed, by our knowledge of almost all epidemic diseases. It would be of interest to know how the meningococcus carrier-rate among patients suffering from such atypical attacks compares with that in healthy contacts and non-contacts living in the epidemic area in view of the wide differences which have been demonstrated under similar circumstances in other diseases. While Dr. Dorgan regards the susceptibility of the individual rather than the virulence of the organism as the determining factor in the occurrence or non-occurrence of meningitis in a person exposed to infection, his article may be read in conjunction with the concluding instalment of the Goulstonian lectures on the Spread of Bacterial Infection, which appears in our present issue. The primary importance of persons suffering from atypical infections in the spread of cerebro-spinal fever would agree well with Dr. W. W. C. Topley's suggestion as to the possible mode of origin of an outbreak of disease. In his view a variation in the biological properties of the parasite would be the essential factor, and the high potential infectivity of the atypical case as compared with the healthy carrier would find its explanation in the fact that the former was harbouring the more infective organisms. Either view would depreciate the general application of measures of isolation in dealing with healthy carriers, while emphasising the crucial importance of improving environmental conditions, more especially by the elimination of overcrowding and the provision of free ventilation.

BRITISH FEDERATION OF MEDICAL AND ALLIED SOCIETIES

(LATE MEDICAL PARLIAMENTARY COMMITTEE).

AT the Conference between the Medical Parliamentary Committee and the representatives of other organisations held on May 2nd [1] it was decided that the giving of effect to seven resolutions then passed should be left to the existing provisional committee. On Friday last, July 11th, at a meeting held in the College of Ambulance, this provisional committee submitted its report.

Dr. ARTHUR LATHAM, honorary secretary of the Medical Parliamentary Committee, was unanimously elected to the chair, when he explained the absence of Sir Watson Cheyne, who had hitherto occupied the position of chairman. Owing to ill-health and the pressure of his Parliamentary duties Sir Watson Cheyne found himself unable to give the necessary time to the affairs of the organisation, and he had written regretting the necessity for his retirement from the office of chairman, which was entirely due to physical disabilities and not to any differences of opinion. He found it inadvisable to accept any outside work, especially in the present conditions of travelling, and he was able to do his Parliamentary work by attending to that and that alone. He was pleased, he added, to leave his name on the committee. In view of Sir Watson Cheyne's resignation, said Dr. Latham, the provisional committee had invited Sir Malcolm Morris to be chairman, and he had accepted the position, but was unable to preside at the present meeting owing to an important engagement previously entered into. Dr. Latham read a letter from Sir Watson Cheyne expressing his pleasure that Sir Malcolm Morris should take his place, and in this letter he indicated as pressing matters in which the activities of the organisation would be most useful—the Bill just introduced to raise the insurance limit to £250, and the Medical Service Bill which Dr. Addison would bring in next winter.

The Future Policy before the Meeting.

Dr. Latham then explained the policy of the Medical Parliamentary Committee, which was intended to be constructive by collecting the opinions of all branches of the medical profession on matters of public health. This idea was submitted to the Conference on May 2nd, when certain resolutions were passed, and a provisional committee was empowered to put these resolutions into shape, and form a new federated body. So far no less than 47 societies had accepted representation on this committee, and it was hoped that the number would be increased when the ideas of the committee were better understood. However, he thought that to persuade the representatives of 47 societies associated with and allied to the medical profession to sit round one table was something of an achievement. The business of the present meeting would be the appointment of an executive in order that work might be started at once, while some additional members would have to be coöpted and the question of the title of the organisation discussed. The name Medical Parliamentary Committee had unfortunately given rise to the idea that the body was going to do something which it never intended to do. The name savoured too much of politics. Lastly, it would be necessary to discuss the question of finance.

The minutes of the meeting on May 2nd were taken as read, when some discussion arose respecting the hour of meeting, as the time most convenient to London and country members respectively clashed, while a time that would be generally convenient to the medical profession might not suit the representatives of allied bodies. It was felt that the convenience of provincial representatives should be considered in order that the organisation might be enabled to get the views of members throughout the country. On the suggestion of the Chairman, the matter was left in the hands of the executive committee.

The Societies Represented.

Dr. N. HOWARD MUMMERY, the honorary organising secretary of the Medical Parliamentary Committee, then read

[1] THE LANCET, May 10th, p. 808.

the names of the societies attending and their representatives as follows:—

Association of Certifying Factory Surgeons (Incorporated)
Association of Medical Officers of Health.
Association of British Postal Medical Officers.
Association of Panel Committees.
Association of Public Vaccinators.
Association of School Medical Officers of Scotland.
Birmingham and District General Practitioners' Union.
British Dental Association.
Brighton and District Medico-Chirurgical Society.
British Science Guild.
Central Committee for the State Registration of Nurses.
College of Nursing, Ltd.
Council of British Ophthalmologists.
Eastern Valley Medical Association.
Harveian Society.
Harrogate Medical Society.
Incorporated Midwives Institute.
Infirmary Medical Superintendents' Society.
Irish Medical Association.
Leeds and West Riding Medico-Chirurgical Association.
London Dermatological Society.
Manchester Odontological Society.
Medical Officers of Schools' Association.
Medical Women's Federation
Medico-Psychological Association of Great Britain and Ireland
Medico-Political Union.
Metropolitan Police Surgeons' Association.
Midland Medical Society.
Midland Obstetrical and Gynæcological Society.
National Association for the Prevention of Tuberculosis.
National Council for Combating Venereal Diseases.
National Medical Journal.
National Medical Union.
New London Dermatological Society.
North London Medical and Chirurgical Society.
North of England Tuberculosis Society.
Pathological Society of Great Britain and Ireland.
Pharmaceutical Society of Great Britain.
Physiological Society.
Poor-law Medical Officers' Association.
Reading Pathological Society.
Royal Institute of Public Health.
The Royal Society of Medicine.
Scottish Union of Medical Women: Eastern Branch and Western Branch.
South-West London Medical Society.
Southampton Medical Parliamentary Committee.
State Medical Service Association.
Tottenham Medical Union.
Tuberculosis Society.

The Council of the British Medical Association had not, he said, sent a representative, but the matter would come up for discussion at the next general meeting of the members.

The Provisional Report.

The report of the provisional subcommittee was then voted upon paragraph by paragraph, when Dr. A. E. BOYCOTT, representing the Pathological Society of Great Britain and Ireland, remarked that if he voted for or against a proposition he must not be taken as pledging his society. Other representatives being in a similar position, the Chairman was subsequently asked for a ruling on the matter, when he said that what was wanted was the definite opinion of representatives, though this would not necessarily commit their societies. Without such definite opinions the committee could not come to a satisfactory conclusion on any subject, and he thought it was the duty of all representatives to vote on the matter before them. The report ran as follows:—

Report of the Provisional Subcommittee Appointed by the Medical Parliamentary Committee at the Conference held at the Central Hall, Westminster, on May 2nd, 1919.

In pursuance of the resolutions passed at the Conference on May 2nd, 1919, the provisional subcommittee have to report:—

1. That the office of the committee has been temporarily established at 20, Hanover-square, London, W.1.

2. That the subcommittee has met on five occasions for the purpose of deliberation and conduct of business.

The following resolutions, as recorded in the minutes of these meetings, have been passed:—

(*a*) The appointment of a provisional chairman in the place of Sir William Watson Cheyne, resigned. This office has been offered to, and has been accepted by, Sir Malcolm Morris, K.C.V.O.

(*b*) The appointment of a provisional organising secretary. This office has been offered to, and has been accepted by, Dr. N. Howard Mummery, who has offered to act in an honorary capacity until the Conference called for July 11th, 1919.

3. That the necessary estimated annual and preliminary expenditure is as follows:—

Annual Expenditure.		*Preliminary Expenditure.*	
Rent of office	£200	Office fittings and furniture	£92
Material and incidental expenses	300	Expenses of incorporation	100
Salaries of organising secretary, clerk, and lobby correspondent...	1326		£192
Annual	£1826		

Total for first year ... ... £2018.

4. That in the opinion of the provisional subcommittee the time has now been reached when it is essential to further expansion and increased activities that:—

(i.) The committee should establish a Federation under the title of "The British Federation of Medical and Allied Societies" to carry on the work commenced by the Medical Parliamentary Committee. Only thus can it acquire the financial basis necessary to its further existence.

(ii.) That such Federation should form itself into an incorporated association, limited by guarantee and not having a share capital, under the Companies' Acts, 1908-1917. That it be registered under the Board of Trade (Section 20) with limited liability, without the word "Limited" after its name, but with the word "Incorporated" added. In this form it is expressly laid down that it cannot be considered a "trade-union." That it be registered under the title of "The British Federation of Medical and Allied Societies (Inc.)," late Medical Parliamentary Committee.

5. That the representatives of the affiliated and allied bodies and the coöpted members shall form the Council of the Federation.

6. That an executive committee be elected to carry out the business of the Federation, with power to engage the services of the necessary officers and servants on the salaried list, obtain the necessary permanent officers of the Federation, with power to appoint subcommittees, and to incur the necessary preliminary expenses.

7. That the following financial scheme be adopted and incorporated in the articles of association:—

(*a*) Entrance fee.

(i.) For each association, society, or allied body represented on the Council of the Federation a sum of not less than two guineas (£2 2*s*.).

(ii.) For each coöpted member of the Council of the Federation a sum of not less than two guineas (£2 2*s*.).

(iii.) At a later date, to be fixed when deemed appropriate by the Council of the Federation, for each directly elected representative of the medical profession a sum of not less than one guinea (£1 1*s*.).

(*b*) Annual subscription.

(i.) That members of each association, society, or allied body represented on the Council of the Federation be asked through the various executives of those bodies to subscribe to the funds of the Federation a sum of not less than half a guinea and thereby constitute themselves members of that Federation.

(ii.) For each coöpted member of the Council of the Federation a sum of not less than two guineas (£2 2*s*.).

(iii.) Subject to par. 7 (a) (iii.) above a sum of not less than one guinea (£1 1*s*.).

(*c*) Guarantee fund.

To meet immediate requirements credit be obtained from a banker in the sum of two thousand pounds (£2000) secured by the personal guarantee of selected members of the Council of the Federation, or other members who may offer to act in that capacity. Provided that ten guarantors, each in the sum of £200, or 20 guarantors, each in the sum of £100, be the number necessary; or such proportion of each as may be deemed advisable. Such guarantees to be required only until funds are available from entrance fees and subscriptions.

The first sections of the report were passed subject to some discussion.

On par. 4, referring to the change of name, the Chairman said that many people thought the organisation was going to engage in politics, and the name Parliamentary Committee was not understood. The industrial bodies of the country usually called their organisations "federations," and he thought it would make clearer the objects of the present body if the name Federation rather than Parliamentary Committee were adopted. After some discussion the change was agreed to, the Chairman stating, in answer to a question, that the change of name did not imply any change in the policy and objects of the Medical Parliamentary Committee.

The Guarantee Fund.

On par. 7, dealing with the financial scheme, some discussion arose as to the powers and responsibilities of the various societies represented in regard to the payment of subscriptions by their members, the Chairman pointing out that any society which did not agree with any of the resolutions that might be passed in regard to finance had a perfect right to withdraw. At present the Federation had no money, and it was necessary if work was to be done that there should be a guarantee fund.

Dr. C. BUTTAR said he had hoped that each society would contribute according to membership. As more and more societies joined 6*d*. a head would cover the whole of the finances required. As long as the Federation did not appeal, as it ought to do, to each individual of the medical profession, a payment of so much per head per member of a society would be the best arrangement.

Finally, it was decided to leave the matter for the present in the hands of the executive committee to draw up a scheme for raising funds which should be submitted to the various societies asking for an expression of opinion, while at the next general meeting the representatives of these societies should be empowered to vote on a scheme.

A guarantee fund of approaching £1300 was then announced.

Coöption of Members of the Council of the Federation.

The number of representatives of the Council is 53, and the number of coöpted members 10, of whom 2 may be

engaged in consulting medical practice. The following were accordingly coöpted:—

Mr. J. Y. W. MacAlister.
Mr. Frank Coke (Ashford).
Dr. W. Hodgson (Crewe).
Sir Thomas Parkinson.
Dr. Howard Marshall (Cirencester).
Mr. E. F. White.
Dr. Arthur Shadwell.
Lieut.-Col. F. E. Fremantle.
Sir Bertrand Dawson.
Mr. J. P. Lockhart-Mummery.

The Executive Committee.

The following Executive Committee of 20 (of whom 4 may be engaged in consulting practice with power to add to their number) was elected:—

Dr. Rashell Davison, Association of Medical Officers of Health.
Dr. H. J. Cardale, Association of Panel Committees.
Mr. C. F. Rilot, British Dental Association.
Sir Ronald Ross, British Science Guild.
Mrs. Bedford Fenwick, Central Committee for the State Registration of Nurses.
Mr. Comyns Berkeley, College of Nursing, Ltd.
Mr. Frank Coke, Medico-Political Union.
Miss Rosalind Paget, Incorporated Midwives Institute.
Dr. Jane Walker, Medical Women's Association.
Dr. R. H. Cole, Medico-Psychological Association.
Mr. E. B. Turner, National Council for Combating Venereal Diseases.
Dr. Edwin Smith, National Medical Union.
Mr. Rowsell, Pharmaceutical Society of Great Britain.
Professor Starling, Physiological Society.
Dr. A. Withers Green, Poor-law Medical Officers' Association.
Dr. W. Pasteur, Royal Society of Medicine.
Dr. Chalmers Watson, Scottish Union of Medical Women.
Dr. Halliday Sutherland, Tuberculosis Society.
Dr. S. Squire Sprigge.
Dr. Arthur Shadwell.

Ex-officio.

Chairman: Sir Malcolm Morris, K.C.V.O.
Vice-chairmen: Dr. Arthur Latham, Dr. E. H. M. Stancomb.
Hon. Treasurers: Sir Thomas Horder, Dr. J. F. Gordon Dill.
Hon. Secretary: Dr. Charles Buttar.

NATIONAL CONFERENCE ON INFANT WELFARE.

(*Continued from p. 78.*)

AT the afternoon session on July 2nd Dr. RHODA ADAMSON, clinical lecturer in obstetrics at the University of Leeds and honorary medical officer to the Leeds Maternity Hospital, spoke on the subject of the

Industrial Employment of Mothers in Relation to Infant Mortality.

She insisted that the most suitable person to attend to the young child was the child's own mother. Failing which, these duties were best carried out by someone trained in infant care. That if the mother was employed in some industry away from home she had to make some provision for the care of her young children during the hours that she could not be with them, and the well-being of the children depended very much upon the type of care the mother was able to substitute for that of her own. She thought that employment of married women was largely a matter of custom in some localities and hard necessity in others Some women continued to work after marriage at the same trades that employed them while unmarried because they preferred this type of work to the dull routine of housework to which they were unaccustomed and because they could marry earlier when the house contained two breadwinners. Others, as a matter of course, gave up all active wage-earning employment on a marriage which had been postponed until the husband was able to support a wife and family with his unaided earnings. Others were driven to seek paid employment at some later period after marriage because the family income without their help was not sufficient to maintain it. Under this heading the speaker included widows with insufficient pensions and married women with invalid or lazy husbands. The children of the home-keeping mother were more usually breast-fed during the earlier months of infancy, she said, because, from her point of view, this method was more economical and simpler than any other method. The children of the mothers working away from home were sometimes breast-fed at night and bottle-fed by day, but more usually entirely bottle-fed. The first method was generally recognised as being the most desirable and to give the infant a far greater chance of life during the early weeks after birth than bottle-feeding with whatever mixture happened to be chosen as a substitute. If the mother was unable to nurse her child the preparation of an artificial bottle-feed required much care and attention; it could not with safety be left to a woman to carry out by the light of nature in a casual way. It was essential, she thought, that the mother should stay at home herself or that there should be adequate provision of well-staffed day nurseries in all areas where mothers of young children were compelled to leave them because of employment away from home. She emphasised the fact that the health of young children was very largely dependent upon their share of fresh air and sunlight and the general cleanliness of their surroundings. So that children living in the country, even though in poor homes, were healthier than those brought up in crowded slum areas, though in such cases the family income might be much greater. In towns, therefore, it was essential that the children should be taken out of doors by their mothers or else placed in an open-air shelter in connexion with some day nursery.

The Provision of Nurseries and the Need of a State Allowance for Mothers.

Failing the general institution of endowment of motherhood and the exclusion of such mothers from industrial employment while in receipt of an allowance, it appeared essential to procure the general provision of nurseries capable of accommodating young children as daily or permanent boarders. Such nurseries were costly to establish and expensive in their upkeep, and no working woman could by her regular payment be expected to defray her share of expense of such a nursery without some additional grant towards the cost from local or central government funds. If, therefore, the State might in either case be expected to contribute towards the expense of maintenance and care of children of the working classes it appeared more reasonable to pay the mother to carry out these duties rather than some other disinterested institution. The speaker suggested that such State allowance should be optional, to be claimed by the mother if she saw fit, and that coupled with its payment should be inspection to ensure that it was being applied for the benefit of the children and incidentally also for the mother. It was well recognised that an infant ran the greatest risk of death during the first three months after birth. Therefore, if some scheme could be devised to make it possible for mothers of children under three months old to remain at home personally to nurse and care for their children a certain saving of infant life might be brought about. The present factory regulations of the Home Office excluded a mother from industrial employment for four weeks after the birth of a child, this exclusion having been enjoined in the interests of the health of the mother, but with this four weeks' exclusion there was no provision whatever for the financial help of the mother to maintain herself and the child, and therefore it possibly involved underfeeding of both mother and child. Personally Dr. Adamson was not in favour of any law or Home Office regulation directed towards the exclusion of all married women with children from industrial employment for any period, however short. She considered that the average mother of young children would prefer to stay at home and look after them if the family income did not need to be augmented by her industrial employment. She thought that the effect of exclusion of such women from factory work would be two-fold, some would practise some form of birth control to avoid the risk of losing their work, and others who had not avoided parenthood would be driven into less well paid employment, such as domestic work, which still necessitated their absence from their home and children.

Miss L. BARKER, O.B.E., of the Training Department, Ministry of Labour, said that mothers were forced into industry by their husbands being: (1) dead; (2) disabled; (3) out of health; (4) of such a low category industrially as to be unable to earn a fair wage; (5) gone away, leaving wife and children; (6) out of employment. She would like to see creches established, with hours to fit those of the working mother, and with rules framed to avoid the ill-effects of broken treatment of child during week-end (overfeeding and the like). Also some sort of centre to which elder children could be sent during out-of-school hours, when

the mother was working. Creches should have a training service or school for nursemaids attached, and the attendance at lectures, needlework classes, &c., of mothers whose children are in residence should be one of the terms under which the child is accepted. Creches or nursery schools might well be centres for antenatal teaching also. Her personal experience was that the health and general physique of children at creches and babies' homes at Woolwich were increased in contrast with those not cared for in this way.

Back-to-back Houses.

Mrs. HOLDEN (Dewsbury), in emphasising the unhealthiness of back-to-back houses, quoted the following table from a pre-war report of the medical officer of health for Dewsbury:—

	Back-to-back houses.		Through houses.
	Working.	Not working.	Mothers not working.
Number of children born ...	108	360	78
Number dying under 1 year	40	34	5
Rate per 1000 deaths	370	94	64

She summed up her arguments against the employment of the nursing mother in industry by stating that first, the strain of the double duty is too much for the mother; secondly, equally important, the atmospheric conditions of a home shut up the greater part of the day are bound to be bad for all, especially the young children.

MEDICINE AND THE LAW.

Medical Fees in Court.

IT was reported recently in the daily press that in an action for damages at Westminster County Court against the London County Council Mr. Blackwell, counsel for a carman, said that a woman doctor from the Royal Free Hospital had been subpœnaed to give evidence. She had been offered a guinea, but wrote that "she could not think of accepting so inadequate a fee." The judge, Sir Alfred Tobin, said he understood from the registrar that the correct fee was one guinea plus travelling expenses, whereupon Mr. Blackwell replied that in this case the expenses would be a few pence. "Fortunately we can get on without her now." His honour is then reported to have observed: "It is a great contempt of court for the lady not to come when proper fee is offered. If any application was made to me to deal with it I should know how to do so. I would deal as severely as I can, for it is most important that justice should be assisted and not impeded." Those who are conversant with county court methods will not too readily assume that learned counsel was correctly instructed when he declared that the lady *had* been subpœnaed. Many house-surgeons and physicians, before now, have been induced to appear in this species of action, have given really expert evidence, and have failed to receive even the usual fee allowed by the rules. But there is, of course, no legitimate excuse, if a subpœna has been accepted, for failure to appear, save physical disability or the order of a higher court; and a witness who has accepted subpœna must be content to receive the fees allowable by the rules of the particular court, unless the solicitor in charge of the case is willing to pay something more substantial. An unwilling witness may, however, always refuse to attend, save after subpœna, to take the oath unless paid the regulation fee, and, having taken the oath, to testify otherwise than as to the facts unless paid a fee satisfactory to himself.

Tuberculosis and Marriage.

The second trial of the case of Porter *v.* Barnard has ended in a verdict for the plaintiff for £250, the judgment including the costs of both trials. The plaintiff had first met the defendant, who at that time was fourth engineer in a tramp steamer, in Richmond Park. He was then home for a brief period of leave and he invited the plaintiff and her sister to tea. After the acquaintance had been renewed during a later return of the defendant to his home he became engaged to be married to the plaintiff. Before the proposed marriage took place, however, the question of whether the plaintiff was suffering from tuberculosis arose, and the defendant's father, being a medical practitioner, made an examination, from which he concluded that it was undesirable that she should be married. The breaking off of the engagement led to the action for breach of promise of marriage which has now ended in the plaintiff's favour, medical evidence having been given on both sides as to the safety or otherwise of marriage in view of the condition of the plaintiff's health. She had been under treatment at the Downs Sanatorium, Sutton, for tuberculosis, so that there was evidence of her having at one time suffered from the disease; but the questions left to the jury indicate the facts which Mr. Justice McCardie considered essential to the establishment of the defence set up. The questions left to the jury and the answers given were:—

(1) "Was the plaintiff suffering from tuberculosis on June 1st, 1918 (the date on which the parties became engaged)?"—"No."
(2) "Was the plaintiff unfit through tuberculosis to marry either (*a*) on October 28th, 1918; (*b*) at Christmas, 1918; or (*c*) within a reasonable time afterwards?"—"No."
(3) "Did the plaintiff know on June 1st, 1918, that she was suffering from tuberculosis?" No answer was given to this question, which, it apparently was considered, should be answered if Question (1) had received an affirmative reply.

The case at any rate seems to show that the courts will recognise the undesirable nature of a marriage between persons one of whom is tuberculous, and will regard the breaking off of an engagement between them as justified, but the various aspects of the question would perhaps have been more clearly considered if the facts had been found to justify a judgment for the defendant.

TUBERCULOSIS.

After-care for Consumptives.

HOWEVER adequate may be the medical treatment provided by county council and insurance committees, there always remains a need for voluntary help in the matter of the care of the tuberculous. Rather than apply for Poor-law relief, many a worker will continue in his employment until medical treatment can be of little use to him, while in cases where medical treatment has already been given a sympathetic interest in his family difficulties from some voluntary committee with a financial backing will often make all the difference between a complete cure and a relapse. The reports of the various care committees in the county of Lancashire show that during the past year 279 patients have been assisted in various ways. Help most frequently takes the form of extra food and clothing. The loan of bedsteads and bedding for those who would otherwise be unable to sleep in separate beds is an important part of the work, but the personal interest of the members of the committee is probably the most important of all, though it does not appear on the balance-sheet.

Segregation of Advanced Consumptives.

At the request of the Southwark borough council the town clerk, the medical officer of health, and the tuberculosis officer have prepared a report on (1) the question of the provision by the State of accommodation other than that provided by institutions maintained by voluntary charitable bodies, in which persons in an advanced stage of consumption can end their days; and (2) the question of compulsory powers being given to local authorities to remove cases where it can be shown that the patients, having regard to their surroundings, are a danger to the health of those with whom they reside. With regard to the first point, the report states that as far back as 1913 at a conference of London sanitary authorities convened by the London County Council, the chairman of the conference drew attention to the necessity for providing "rest homes," and pointed out how undesirable it was that advanced consumptives should be mixed with the more hopeful cases. The only provision made by the State at present is accommodation in a Poor-law institute and a number of beds for discharged soldiers provided by arrangement with the Insurance Commissioners. Very few consumptives will voluntarily enter a workhouse infirmary. The medical officer of health has now been unofficially informed that if the borough council makes an application to the London County Council to have the hospital in the Kennington Park-road taken over for the reception of the cases of tuberculosis above referred to, the London County Council will be prepared to bear all the maintenance charges. The acquiring of this hospital would not prevent the Council recommending legislation giving powers for the compulsory

removal of dangerous infectious cases of tuberculosis from their homes to an institution. This question is dealt with in the second part of the report, which points out that compulsory powers of removal by local authorities in respect of certain cases of infectious disease already exist under the Public Health (London) Act, 1891, but that this does not extend to tuberculosis.

"Article 7 of the Tuberculosis (In hospital) Regulations, 1911, provides that nothing in the Regulation shall authorise or require a medical officer of health or a local authority to put in force any enactment which renders a consumptive or the person in charge of the patient or any other persons liable to a penalty, or subjects the person to any restriction, prohibition or disability affecting himself or his employment, occupation or means of livelihood on the ground of his suffering from tuberculosis.

Compulsory powers of removal have, however, been obtained by some of the provincial councils under private Acts of Parliament—e.g., the St. Helens Corporation Act of 1908.

The Public Health (Prevention and Treatment of Disease) Act, 1913, also contains a special clause dealing with treatment of tuberculosis. Sec. 3 empowers any sanitary authority to make any such arrangement as may be sanctioned by the Local Government for the treatment of tuberculosis; this power to be in addition to and not in derogation of any other power."

If this section be acted upon it may become the practice of one borough compulsorily to remove advanced consumptives, whilst another might adopt less drastic means. Having regard to the fact that a certain percentage of consumptive cases are a danger and cause of infection to others, and refuse to enter an institution or take steps to prevent the spread of the disease, compulsory removal should be general throughout the country in certain cases. The Tuberculosis Regulations of 1911 should be extended so as to give the medical officer of health power to order, with due legal precautions, the compulsory removal of a case where it is clearly proved that such a case is tending to spread the disease and the affected person refuses to take advantage of voluntary measures offered.

The Hairmyres Colony.

The *British Journal of Tuberculosis* for July makes Mr. J. E. Chapman's memorandum on "Colonies" (L. G. B. Reports on Public Health Subjects. New Series. No. 122) the occasion for a long and useful review of the place of such colonies in the anti-tuberculosis campaign. An interesting experiment was confirmed on June 14th when the Hairmyres Colony was officially opened by the Secretary for Scotland. As long ago as 1905 the district committee of the Middle Ward of Lanarkshire made a beginning in the systematic treatment of pulmonary tuberculosis under a system of voluntary notification. Since that time their hands have been greatly strengthened by the coming of compulsory notification and the provisions in the Insurance Act for the treatment of tuberculosis. Experience has shown them that the method of treating consumptives for three months in a sanatorium and then allowing their patients to compete for a livelihood in the open market of labour was satisfactory neither from the clinical point of view nor from that of the local authority which was constantly called upon to provide treatment for cases of relapse. The colony will be peopled by children as well as by selected cases of adults in whom the disease has been arrested by sanatorium treatment. The former will be taught in open-air schools, and the latter trained, under medical supervision, in various outdoor industries, such as market-gardening, bee-keeping, poultry-farming, and forestry.

A Colony Scheme for the East Midlands.

The Mayor of Nottingham with Major Brockington, of Leicester, recently presented a tuberculosis colony scheme to the Minister of Pensions on behalf of the East Midlands Joint Committee. The site chosen by the committee for the establishment of a training colony is at Bretby Hall, near Burton-on-Trent. The Derby borough committee, which is at present dealing with a large number of applications from consumptives, has passed a resolution strongly urging the Government to give effect to the scheme.

Anti-tuberculosis Campaign in Bombay.

The annual report of the King George V. Anti-Tuberculosis League shows an increase in the amount of treatment provided, the patients treated being 1215, as compared with 972 in 1917. On Dec. 7th, 1918, Lord and Lady Willingdon opened a sanatorium, which has been erected by the league from voluntary subscriptions. Up to the end of last year treatment was given for the most part in the two dispensaries, in which, since 1913, more than 4000 cases have received treatment. About three-quarters of these cases had tuberculosis of the lungs and the remainder were chiefly cases of tuberculous glands. Domiciliary treatment has also been supplied by the doctors and nurses, and the occasion made use of for much valuable propaganda. This part of its work is rightly regarded by the officers of the league as very important, since consumption spreads to a great extent among the uneducated natives who have no conception of its infectivity. For the enlightenment of these classes lectures are arranged in the different native languages and pamphlets are distributed describing the early signs of consumption, and giving instructions for its treatment in the home. A systematic examination of school children has convinced the medical officers that early tubercle can often be diagnosed by loss of weight.

The American Tuberculosis Association.

At the annual meeting of this association held recently in Atlantic City Sir William Osler was elected a vice-president. A resolution was adopted, viewing with grave concern the efforts being made in certain quarters to have the Daylight Saving Bill repealed, and protesting against any attempts to impede the operation of such law. The great help it was at the present time in preserving the health of the country generally was emphasised. The Army medical officers present discussed the responsibility of the Government for the proper care and treatment of the tuberculous soldier prior to his return to civilian life. A representative from Surgeon-General Estes Nichols's office (of No. 16 General Hospital) then described a plan which was under consideration. It was proposed, he stated, to give treatment in special reconstruction towns or communities, which would be located upon lands in the National forests, the idea being to attract the patients to healthful wood-working industries, and to afford them an opportunity to retain control of the land holdings after they were cured. They would be under proper medical supervision, but not to the same extent, of course, as during their time in a sanatorium. Such communities would require financial assistance at first, but eventually should become self-supporting.

The Hog as a Test for Bovine Tubercle.

Dr. Burton Rogers, of Chicago, Illinois, has recently drawn attention to the value of the hog as an indicator of the existence of bovine tuberculosis on a farm. Wherever pigs and cows are kept together it is found that the former greedily devour the fæces of the latter; indeed, the symbiosis is often purposely arranged in order that cowsheds may be kept clean. The tuberculous cows swallow their sputum, and the bacilli thus pass out in their fæces, with the result that the pigs become infected. Among 40 million hogs examined by American veterinary inspectors in 1917 3,974,000, or nearly 10 per cent., were found to be tuberculous. Dr. Rogers points out that if the pigs slaughtered and subsequently examined had been previously labelled with the name of the farm on which they were reared, valuable presumptive evidence of the existence of bovine tubercle and of its localisation to specific farms would have been obtained and could have been used with great advantage in a campaign to eradicate the disease from among cattle.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

An Indian Ministry of Health.

THE conference of provincial medical and sanitary officers recently summoned by the Government of India has concluded its meetings at Simla under the presidency of Sir San Karan Nair, member of the Viceroy's Council for Education and Sanitation, who invited his hearers to consider how a central health organisation could coördinate the work of preventive action, clinical practice, and medical research. As regards the question of assistance to the provinces in severe epidemics, he made the suggestion of a mobile corps, lent in normal times to the provinces to supplement the provincial staffs, but subject to the withdrawal by the Government of India acting on the advice of its Public Health Board, in order to concentrate in any area where extensive epidemic disease had broken out. The function of the corps would include popular education in preventive methods. A resolution was passed calling for the establishment of a Central Public Health Board consisting

of official and non-official members, and the creation of similar boards in the provinces. The conference laid stress on the importance of certain kindred measures such as the establishment of an epidemiological statistical bureau, the increase of curative medical staffs, the multiplication of dispensaries, and the future development of research facilities on the lines of the Central Research Institute.

Lahore Milk-supply.

In the course of the campaign which he has inaugurated against food adulteration the officer commanding the Lahore area, now under martial law, has come across some surprising figures in regard to the milk-supply. Of large numbers of samples that have been analysed only two have been found absolutely pure, the extent of adulteration varying from 2 to 34 per cent., with a general average of not less than 10 per cent. About 2000 maunds of milk per diem are consumed in the Punjab capital, which would mean that 200 maunds of water are being daily sold as milk. As the price of milk is 3 annas per seer, or Rs.7·8 per maund, the Lahore public are daily being robbed of Rs.1500, or, say, Rs.5½ lakhs, per annum. Heavy fines and sentences of imprisonment under martial law have for the moment practically stamped out the practice of adulteration, with the rather amazing result that, the available number of cows remaining the same, there is a distinct shortage of milk.

The Red Cross in India.

The Indian Joint War Committee of the Order of St. John of Jerusalem and the British Red Cross Society have just issued their report on last year's activities. The figures of expenditure in the various centres in which Indian Expeditionary Forces were engaged and in India itself speak eloquently of the extent of its operations. The total expenditure during the year was 51¾ lakhs of rupees (£300,000 sterling); 37¾ lakhs were expended on account of Mesopotamia, over 1¼ on East Africa, Egypt, and Palestine, and the remainder was made up by expenditure on the Marri and Waziristan operation and on hospitals in India itself. The expenses of management amount only to 63 per cent. (or just over 3 pies in the rupee) of the total expenditure. The history of the year shows great progress in the assumption by Government of responsibility for this type of expenditure. The standard supply of Government equipment to military hospitals and field medical units has been greatly extended, and numerous articles originally classed as "comforts" are now recognised as "necessaries." The burden, which will in the future fall on Red Cross activities, will thus be materially lightened.—The Baluchistan Red Cross and Comforts Fund has undertaken to supply the whole of the troops in the East Persian Cordon and on the lines of communication with regular consignments of tobacco and other amenities, which are sent to each unit in rotation.

The Health of the Army in India.

The annual report of the Sanitary Commissioner with the Government of India has just been published. The figures presented compare favourably with those of the two preceding years; for 1917 the death-rate was 4·83 per 1000, as against 6·54 in 1916, 5·95 in 1915, and 4·51 the ratio for the pre-war quinquennium, while the admission ratio is stated at 771·7 per 1000, comparing with 772 in 1916, 823·1 in 1915, and 567·2 in the quinquennium before the war. There was a substantial increase, however, in the ratio of constantly sick, even when comparison is made with the two preceding years, the figures for 1917 being 45·66 per 1000, while the ratio was 39·75 in 1916 and 39·08 in 1915. This difference, we are told, is "accounted for chiefly by the increased number of admissions for two diseases which require prolonged treatment—namely, venereal disease and malaria—of which diseases the average constantly sick ratio has increased 5·33 per 1000." The ratio of men sent home invalided was considerably smaller than in the two preceding years, though very much greater than in the pre-war period. Malaria was again the great cause of sickness and inefficiency among the British troops in India. The mortality rate among the Indian troops showed a marked increase, the figure being 11·51 per 1000 as compared with 8·97 in 1916 and 8·55 in 1915. An increase in venereal disease was also experienced among the India troops, the chief factor in which is reported to have been the large number of young recruits constantly joining stations and replacing the trained men going on active service.

Correspondence.

"Audi alteram partem."

A CRITICISM OF THE MEMORANDUM ON MALARIA.

To the Editor of THE LANCET.

SIR,—You published in THE LANCET of July 12th a note upon the Memorandum on Malaria, recently issued by the Ministry of Pensions, and purporting to assist the practitioner in dealing with malaria and, in particular, with the diagnosis, treatment, and prevention of this disease. Bearing the name of Sir Ronald Ross, this Memorandum is certain to receive considerable attention, and to a smaller circle the name of his collaborator, Lieutenant-Colonel S. P. James, will be equally well known.

Perusal of this Memorandum shows that it is written by those who have but little knowledge of the circumstances of general practice and leads one to suppose that adherence to its precepts would be of grave disadvantage to our patients, particularly pensioners, and ourselves. There is also a wider point of view. This is an official Memorandum, and may be presumed to carry on the army policy of occasional issue of memoranda on diseases of immediate importance. The policy was admirable, but the actual memoranda were often of dubious value. One might well have hoped that the Pensions Ministry would have sought to improve on this. It has not done so. If the criticisms I make are sustained there can be no doubt that the pamphlet ought to be superseded forthwith.

Criticisms and Reasons.

I make the following criticisms, for each of which I adduce reasons, viz.:—

(1) That the description of malaria given is not that of the form of malaria which will give us most trouble in the British Isles, and is, moreover, calculated rather to obscure than to elucidate the nature of the disease.

(2) That the methods of diagnosis on which most emphasis is laid are of little or no value to the practitioner in the British Isles, and that important methods of diagnosis have been omitted.

(3) That the treatment suggested is not adapted to the class of case to be treated, is in part dangerous, and errs gravely in emphasising the value of quinine and excluding other factors necessary for recovery.

1. *Description of Malaria.*

The reasons for my first criticism are as follows. The description of malaria as a morbid process takes up most of the paragraphs headed "The Diagnosis of Malaria." It is almost wholly devoted to the nature and periodicity of acute attacks of fever. Particular emphasis is laid on periodicity. Only in the rarest cases is the general practitioner likely to be able to keep or obtain any accurate record of his patient's temperature. These paragraphs are therefore almost useless. The description of a rigor is, of course, accurate enough, but the general practitioner, faced with a definite rigor in a patient returned from abroad, and probably volunteering the information that he has an attack of ague, has no need to read up the symptoms of malarial rigor. The symptoms of the apyrexial stage are hardly mentioned, and the disease is dealt with as if it consisted of a sequence of rigors with an absolutely inactive infection between times. This is scientifically incorrect and misleading, and clinically very fallacious. However, it is admitted that a succession of rigors may give rise to certain signs, &c. These are described under the heading "Malarial Cachexia." I quote, "Considerable enlargement of the spleen and severe anæmia are the obvious clinical physical signs." "Serious symptoms are usually absent unless the patient is suffering from another disease." "Chronic irregular 'low' fever is not present." "As a rule, patients suffering from this condition are not emaciated." One can only remark that if such a condition as considerable splenic enlargement and severe anæmia without serious symptoms or fever or emaciation does actually exist, I never had the fortune to see it in one of Sir Ronald Ross's own hospitals. It may occur in the tropics, but it does not at home. My experience in two special malaria hospitals strongly suggests that this sort of clinical

picture-making is inaccurate and misleading when addressed to practitioners in the British Isles, and is therefore wholly out of place in the Memorandum. There is also a list of "the chief 'pernicious' symptoms sometimes met with in cases of acute malarial fever." These are useful in their place, but they are not nearly so useful as would have been some account of the symptoms as we shall see them and as they have actually been seen in the hospitals over which Sir Ronald Ross held sway. I would instance chronic tachycardia and "effort syndrome," chronic headache and depression, chronic pains in the side, &c. I have dealt with these elsewhere.[1] My subsequent experience has shown me that I was right in supposing that it was such symptoms as these that were going to be the despair of medical referees, medical boards, and practitioners, whereas those of the acute attack presented no difficulty. I should like further to state that these symptoms were studied only with the strongest official discouragement, even to the extent of refusal of permission to publish any paper on them. That this should be so makes one doubly anxious to raise discussion on the deductions of Sir Ronald Ross and others from the same material, for the two different views we have of the disease as seen at home are scarcely compatible, and it is well that truth should prevail.

2. *Methods of Diagnosis.*

My second point is that the methods of diagnosis on which most emphasis is laid are of little or no value to the practitioner in the British Isles. These methods are three. The first is entitled "Clinical Symptoms and Signs." The only one mentioned is periodic fever. This is the one sign of which the practitioner can hardly hope to get accurate record. The second is "The Results of Blood Examination." No mention is made of what results are to be expected, presumably nothing but the presence of the parasite suffices. Yet there are other important points in the blood examination—e.g., pigment cells; and even if the practitioner may be presumed to be too busy to examine his own blood slides, he might at least be put in a position to understand a specialist report on the same. The third point is "The Effects of Therapeutic Doses of Quinine." We may sometimes be driven to this resort, and it is one to bear well in mind, but it is not the kind of method which much enhances one's reputation among patients, and it is absolutely useless unless fever be actually present. Most of the pensioners who have come to me for advice had to be diagnosed by means other than any of these three, and so also will they have to be diagnosed and their pensions assessed by medical boards and referees. No other method of diagnosis is mentioned. Might not the hyperalgesic areas described by Carmalt Jones have been just mentioned? Is not herpes labialis important confirmatory evidence where a recent attack is alleged, or perisplenitis, or slight jaundice? I feel fully justified in the statement that the methods of diagnosis laid down are of little use to practitioners, while those omitted would have been of great assistance.

3. *Treatment Suggested.*

My third point is that the treatment suggested is not adapted to the class of case to be treated, is in part dangerous, and errs gravely in emphasising the value of quinine and excluding other factors necessary for recovery. The treatment advocated is quinine and nothing else. This is to be given for *three months* after each acute attack. I have seen a great many patients from Sir Ronald Ross's hospitals, and never did I meet one who could suggest he was cured by any method of giving quinine. Some had had heroic doses, some had had none. One of the latter was cured, many of the former were certainly not. This is a vexed question, but I would ask fellow-practitioners dealing with malaria, which is being overcome by the natural resistance of the body in this country, not to follow methods which may be suitable for those who are liable to frequent reinfection—a distinction between cases which Sir Ronald Ross does not seem to make or to consider to have any bearing on treatment. The treatment I brand as dangerous is that by the intramuscular route. The instructions are "..... the operation presents no difficulty. The stab should be made deeply into the gluteal muscle and the solution injected." The result of such instructions, or lack of more definite instructions, resulted in so many paralysed limbs that I was informed by an officer on a hospital ship that each boat was bringing home four or five cases. Certainly there followed stringent orders that intramuscular quinine must only be given under the supervision of the officer in charge of a medical division. Moreover, Colonel Leonard Dudgeon has recently most ably demonstrated the destructive results of intramuscular injections. Are we to learn our lessons so badly that this method is still to be advocated with all the weight of Sir Ronald Ross's name and the approval of a Government department? We may well say, "Pity the poor pensioner." Finally, I desire to draw attention to the total lack of any mention of the general hygienic treatment of malaria as carried out in convalescent camps and of the peculiar measures adapted to the successful treatment of such otherwise fatal complications as blackwater fever, and, generally speaking, the "pernicious" symptoms referred to in the Memorandum.

The Author's Views.

I fully recognise the fact that I am pitting the opinions of an unknown individual against those of an acknowledged authority. But the practical results of this authority and a genuine interest in the welfare of pensioners compels me to the opinion that it is high time someone spoke up. I would state my own views on the diagnosis and treatment of malaria as follows:—

1. The diagnosis of malaria as seen between actual attacks in this country can only be made by careful investigation of all the symptoms, including particularly those mentioned in the paper referred to, and only by such careful attention can any proper estimate of the degree of disablement be made.

2. The most important principle in the treatment of malaria in pensioners is the improvement of the natural resistance of the body with the aid of as little quinine as possible.

I am, Sir, yours faithfully,

GORDON WARD, M.D. Lond.

Sevenoaks, Kent, July 14th, 1919.

[1] Proc. Roy. Soc. Med., 1919, xii., Section of Medicine, pp. 15-36.

TRAINING OF THE JUNIOR OFFICERS OF THE INDIAN MEDICAL SERVICE IN INDIA.

To the Editor of THE LANCET.

SIR,—The enclosed letter, addressed to the Secretary of State for India, if published in THE LANCET, should arouse professional interest in a very important question.

I am, Sir, yours faithfully,

G. J. H. EVATT, M.D.,
Major-General (retd.).

July 10th, 1919.

[ENCLOSURE.]

From Major-General Sir George J. H. Evatt, K.C.B., M.D.,
Junior United Service Club, London, S.W.1.

To the Right Hon. the Secretary of State for India,
India Office, London. July 10th, 1919.

SIR,—I have the honour to submit the following proposals as to further training in India of the young officers of the Indian Medical Service before appointment to any medical post in India.

(2) All newly appointed medical officers to be detained at Bombay on arrival for six weeks and to be constituted in a "class" to study Health Conditions and Sanitary Arrangements in and about Bombay city and neighbourhood.

(3) Representative officials of local experience to show and explain to the class of young officers:—

(*a*) The system of Drainage of Bombay city.

(*b*) The Sewerage system of Bombay city and district.

(*c*) The Water-supply system as to collection, storage, and distribution.

(*d*) Public Baths and Wash-houses.

(*e*) Segregation of Infectious and Contagious Diseases, arrangements for prevention and treatment of Cholera, Small-pox, Plague, Malaria. Segregation hospitals. Vaccination in full. Leprosy to be studied in full.

(*f*) Hospitals in Bombay to be visited as to structure. Training of nurses. Convalescent establishments attached to hospitals. The cost and expenditure of hospitals and the means of raising funds explained.

(*g*) Lunacy and Lunatic Asylums to be fully visited and explained to the young officers in a class by efficient specialist officer.

(*h*) The Races of the Indian People to be explained by a skilled specialist in this racial subject.

(*j*) The Creeds and Castes of the Indian People to be popularly explained to the young officers.

(*k*) Outline description of the Indian Empire, its Presidencies, Native states, Provinces, and description of Government methods. The Province and the District.

(*l*) The Methods of dealing with prisoners under confinement in jails throughout the country. Jails to be visited and explained to the young officers very fully.

(*m*) The Cantonment of Poona to be visited, studied, and explained by competent local officers. Barracks and hospitals to be seen.

(*n*) The class to be controlled by the Director of Medical Services, Bombay, who would nominate instructors and maintain discipline during the course.

(*o*) Detention Allowance to be granted to the young officers. A medical officer not under the rank of Major to be attached to the class pro tem. as Discipline Officer and Director of Studies and Chief Instructor. Two officers as assistant instructors could be allowed.

(*p*) An Examination might be held at the termination of the class to see what progress has been made.

(*q*) Certain public men who would represent sections of the Indian people to be invited to address these young officers during the course of study.

I should be glad to have an acknowledgment of this letter. Your obedient servant,

London, 1919. G. J. H. EVATT, M.G.

INDUSTRIAL MEDICAL SERVICE.

To the Editor of THE LANCET.

SIR,—Dr. Prosser White's letter in THE LANCET of July 5th emphasises two of the most important duties of a real factory doctor—i.e., close familiarity with actual working conditions and the necessary investigation of all cases of injury. To familiarise himself properly with the conditions of employment and with the reactions of the workers to their work the doctor should practically live and work amongst his workers. Periodical inspection by a trained observer can, perhaps, do much, but even in his case several days spent in the factory would throw light on much that passes unnoticed or appears obscure on a cursory inspection and would familiarise him with the local difficulties which his full-time colleague appreciates so thoroughly. For the purpose of prevention of accident and disease the constant supervision of the factory M.O. and of his "tentacles"—i.e., the foremen, works managers, &c., who work with him to the common end of good output, health, and content of workers—is far more valuable to both workers and management than occasional visits by headquarters staff and by the C.F.S. when, and not till when, some trouble has occurred. Moreover, the full-time man will have examined every worker and carded his findings for reference. This index will serve as evidence in case of a claim for compensation under the Workmen's Compensation Act.

The Industrial "Expert."

In the second of your special articles on an industrial medical service you suggest that it is for the Certifying Surgeons' Association to organise proper training schemes for the training of the industrial specialist. But in so doing the interests of the full-time medical officer and that of the lay workers in the factory should be studiously borne in mind. In practice full-time medical officers handle many things which at first sight do not appear strictly within the duties of a medical man, such as absenteeism and its prevention, causes of wastage of factory personnel, the administration of the Workmen's Compensation Act, canteen supervision, and the investigation of many grievances of workmen (since there is very often a medical side to such).

I can scarcely consider the quarterly inspection of workers as adequate to detect hygienic faults. Nor is it satisfactory to leave the working out of the remedies to an "expert" from headquarters, invaluable though his advice may be in its proper place. The full-time medical officer is also in a better position to get faults remedied than the headquarters man, since he can continue worrying the management until the fault is remedied.

The Factory Doctor and Private Practice.

It is doubtful how much private practice a factory doctor should undertake. On the one hand, he should be in touch with the modern developments of medicine, but on the other it is his duty to treat the factory rather than the individual worker, which means that his function is preventive rather than curative so far as the individual is concerned. The workman's panel doctor is the man to represent the private interests of the individual. Moreover, the man has a legal right to free choice of doctor, and an attempt to force him to choose the factory doctor is scarcely to be desired in a civilian community. Cases will arise in which the apparent interest of the factory runs counter to that of the man, as when tuberculosis or venereal disease is in question. How, then, can a doctor serve both masters fairly and please both? He will also run the risk of losing practice if he does not please the worker and his wife by his decisions.

Supply and Demand.

It is true enough, as stated in the article, that supply creates demand; and here trained factory doctors are the supply. But demand should be stimulated simultaneously, and that was why I wrote to the *Times* and *Cassier's Monthly* rather than in the first instance to medical papers. The daily press has avoided such subjects till lately, perhaps fearing that the political aspect of attempts to benefit the condition of workers might do them harm. Managers in the past have regarded the doctor askance, since it is through his certificates that they have lost labour. Some of them are beginning to see that had the doctor been in charge, they might have at least lost less labour, since he would probably have sent the worker off duty sooner, and so prevented a prolonged illness. Moreover, the full-time man is far more in a position to judge whether the disease or injury was in fact due to factory conditions than an outsider, since he should have at his disposal the records of work done by each worker on any day, as well as legal evidence, with witnesses' names, in case of accident, besides a more intimate knowledge of the factory conditions and of any peculiarities in the way of special poisonings or disorders due to special processes used in the factory. The value of a full-time doctor previously trained in factory medicine and law, as well as in the other accessory subjects needed by a factory doctor, will be evident to an enlightened manager, and such a doctor will stand a better chance of getting a good appointment. It is of no use to supply these men without some sort of guarantee that they will get suitably paid jobs. If we would raise the demand for trained factory doctors, we should address the managers in terms of output, the workers in those of wages, and the general public in those of industrial peace and health. The three things are synonymous, but the form in which they appeal to the different classes concerned varies, and should be considered in our appeals. The type of man to train as a factory doctor is the enthusiast with the doggedness of the "importunate widow." He should have had some training in research methods, and should be a good physiologist and psychologist, knowing something of mass-psychology.

I am, Sir, yours faithfully,

July 5th, 1919. H. GEORGE P. CASTELLAIN.

EPIDEMIC PERINEPHRIC SUPPURATION.

To the Editor of THE LANCET.

SIR,—The recent letters in THE LANCET on the above subject must have been of great interest to a large number of medical officers who have served abroad during the last few years. In Macedonia there were many cases: the diagnosis was complicated by the prevalence of large and tender livers and spleens. Lieutenant-Colonel J. Patrick and the writer collected the notes of some 20 cases last year, and this number falls far short of the total that occurred in the Force. As regards bacteriology, *Staphylococcus aureus* is undoubtedly the usual organism present in the pus. In one case Captain R. R. Elworthy isolated a *Staphylococcus albus* and this was confirmed by Colonel Leonard Dudgeon. Dr. W. Pasteur may be interested to hear that I know of five cases who died of staphylococcal pyæmia. In at least one of these *Staphylococcus aureus* was isolated by blood culture. As regards his statement that "the urine never contained pus," pus, in quantities varying from a trace to a considerable quantity, was present in half our cases. Albumin was present in rather more than half, and *Staphylococcus aureus* was isolated from the urine in rather less than half the cases.

Radiographic examination was helpful in some cases, the usual signs being a haziness on the affected side with loss of definition of the kidney shadow and of the shadows thrown by the psoas and quadratus lumborum. Diminution of the movement of the diaphragm on the affected side was also noted in some, with absence of elevation of the dome, a point which helped to differentiate a right perinephric

abscess from a hepatic abscess. The vertebral shadows were normal. All the cases referred to occurred before the influenza scourge reached the Balkans. I have no reason to think that influenza affected the incidence of the perinephric infection, though I have heard of cases in which this abscess occurred in patients suffering from influenza and pneumonia.

I am, Sir, yours faithfully,

H. A. T. FAIRBANK,

Major, R.A.M.C. (T.F.), late Lieutenant-Colonel; Assistant Consulting Surgeon, B.S.F.

Harley-street, W., July 9th, 1919.

THE POSITION OF NATIONAL STATISTICS.

To the Editor of THE LANCET.

SIR,—It is a matter of common knowledge to all who have had occasion to use official statistics, whether published or departmental, that the national and imperial equipment for obtaining and publishing statistical data is very imperfect in its scope and inadequate in its machinery. Further, the efforts made are departmental, are under no common controlling or directing authority, and suffer very gravely from lack of coördination. There is no need to adduce proofs of these statements nor to enumerate the various efforts, fruitless in the main, which have hitherto been made to remedy these defects.

The Council of the Royal Statistical Society have appointed a special committee to deal with the subject in the belief that the time is now ripe for a new movement in the direction of reform and that the consciousness of the existing defects is present to the minds of His Majesty's Ministers, Members of Parliament, and civil servants, as well as to others interested in statistics. It is proposed to petition His Majesty's Government to set up a Parliamentary Committee to examine the whole question of the collection and presentation of public statistics, and to report on means of improvement. It is believed that this method of procedure is more likely to be effective than the pressing of specific proposals on His Majesty's Ministers. The officers of local governing and other public bodies, as well as of scientific societies, are being invited to bring the matter at once before their councils. Moreover, publicists and others who are known to be interested, are being approached directly.

We ask the courtesy of your columns to lend support to this movement, and invite your readers to help with their influence and signatures. The Council will be glad if all who are disposed to sign such a petition would communicate with the Secretary, Official Statistics Committee, Royal Statistical Society, 9, Adelphi-terrace, W.C. 2. A copy of the petition will then in due course be sent to them for signature. I am, Sir, yours faithfully,

GEOFFREY DRAGE,

July 10th, 1919. Chairman, Official Statistics Committee.

HUTCHINSON'S TEETH.

To the Editor of THE LANCET.

SIR,—The point raised by Dr. David Walsh in a letter in your issue of July 12th has been dealt with by two masters of the craft. Sir Jonathan Hutchinson,[1] in an original communication to the Pathological Society, made the following statement:—

"The recognition of the subjects of inherited syphilis, by means of their incisor teeth, can only be effected, with any confidence, between the ages of 8 and from 25 to 30. Later than 31 the notches have generally been worn level, and the teeth merely resemble those of a much older person. I have seen teeth preserving their peculiar syphilitic stamp in patients of middle age, but in a large majority of instances such is not the fact."

Professor A. Fournier,[2] in his lectures on the subject, states—the translation is a literal one:

"A second point, and one of real practical interest: the Hutchinson tooth modifies itself in form beyond the age of adolescence and finishes by losing absolutely its characteristic notch. Under the influence of functional use the arch of the free border diminishes progressively in height, and the mathematical rise is lowered. It might be described as an arch which is falling in. There comes a time when the curve of the arch is scarcely perceptible. The arch appears to have straightened itself out. Finally, all trace of the notch disappears, and the free border transforms itself into a nearly straight line. To be precise, from the age of 20 to 22 years, the notch is markedly lessened, at 25 it is almost straight. At this period there still exists, for a certain time at least, a certain sign which allows us to recognise a lesion, *it is the bevel of the anterior border of the notch.* Remember that the Hutchinson notch is cut away from above downwards, and from before backwards at the expense of the anterior border. This bevel, which caps and dominates the notch, is naturally only affected in the later stages, by the rubbing away of the tooth, therefore it persists, and is quite easily recognisable, at a period when the notch has disappeared. It constitutes, therefore, the last trace of the lesion. After the age of 25 years the bevel in its turn becomes effaced ..... this fact is so well known that it has been very truly stated that after the thirtieth year the Hutchinson tooth no longer exists."

To illustrate his lecture Fournier showed a case which must have very closely resembled the case described by Dr. Walsh. I am, Sir, yours faithfully,

G. D. KETTLEWELL.

V.D. Clinic, South Devon and East Cornwall Hospital, Plymouth, July 12th, 1919.

[1] Trans. Path. Socty., x., 296.

[2] La Syphilis Héréditaire Tardive, 1886, pp. 91, 92.

Obituary.

FREDERICK PAGE, M.D. EDIN., F.R.C.S. ENG., D.C.L. DURH.,

EMERITUS PROFESSOR OF SURGERY IN THE UNIVERSITY OF DURHAM.

Professor F. Page died at his residence, 20, Victoria-square, Newcastle-on-Tyne, on July 3rd, at the age of 79 years. He was the son of a well-known surgeon in Portsmouth, and after a private school education entered Edinburgh University, where he graduated M.D. in 1868, becoming house physician at the infirmary, and then enlarging his range of vision by a trip to Western Australia, where he held a position at the Colonial Hospital, Perth. Four years on the junior staff of the Royal Infirmary, Newcastle-on-Tyne, determined his stay in the city with which his professional and public activities were thereafter identified. As a surgeon his reputation soon extended beyond the Royal Infirmary and the Fleming Memorial Hospital for Sick Children, where his attendance was assiduous. He became professor of surgery in the University of Durham and registrar of the College of Medicine, receiving in 1888 the degree of M.A. (hon. causâ), and examining in clinical surgery at his old University of Edinburgh. To a number of special hospitals he was also attached in a consulting capacity. To most men these onerous duties would have afforded sufficient outlet for their powers, but Page contrived to reconcile a life of public service with his many professional engagements. He was on the Commission of the Peace, becoming chairman of the visiting committee of prison justices and presided over the licensing committee for the city. In private life his tastes were literary and dramatic.

Professor Page married in 1876 the eldest daughter of Mr. John Graham and niece of Professor T. Graham, F.R.S., sometime Master of the Mint, by whom he had a son and two daughters.

SIR J. H. MEIRING BECK.

THE death of Senator Sir J. H. Meiring Beck, M.R.C.P., F.R.S.E., Minister of Posts and Telegraphs in General Louis Botha's Cabinet, is a great loss to the Union of South Africa. Sir Meiring Beck was a true South African, and his chief aim during his political life was to heal racial estrangements and mollify party asperities. While a loyal adherent of General Botha, he was popular with all political parties. He combined, in fact, in no small degree the best attributes of a cultured English gentleman with the fervour of the Africander patriot. Born at Worcester, Cape Province, in 1856, he was educated at the South African College, Cape Town, and afterwards studied medicine in Edinburgh, Berlin, and Vienna. At Edinburgh he graduated with first-class honours, gaining the Beaver Scholarship. He practised at Kimberley, Worcester, and Rondebosch, becoming President of the Colonial Medical Council and President of the British Medical Association, Cape Town. For over 20 years he was a member of the Cape University Council.

Sir Meiring Beck represented his native town of Worcester in the Cape Parliament, was a Cape delegate at the National Convention of 1908–9, and on the creation of the Union was made a Senator. After filling the post of chairman of committees in the Senate he became Minister of Posts and Telegraphs in 1916.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A quarterly meeting of the Council was held on July 10th, Sir George H. Makins, the President, being in the chair.—The President reported the result of the recent meeting of Fellows for the election of two members of Council as given in THE LANCET of July 12th, and Sir Berkeley Moynihan and Sir Cuthbert Wallace were introduced and made declarations in the terms of the oath prescribed by the Charter of 1800 and took their seats as members of the Council.—It was resolved to grant, in conjunction with the Royal College of Physicians of London, Diplomas in Public Health to 12 successful candidates (11 men and one woman).—The recent resolution of the General Medical Council that every student should be required in future to attend a practical course in ophthalmology was considered, and it was resolved to refer it to the Committee of Management for consideration.—A letter was read from the secretary of the Joint Matriculation Board of the Universities of Manchester, Liverpool, Sheffield, and Birmingham, inquiring if the College would accept the school certificate issued by the Board for the purpose of the exemption of the holder of such a certificate from the Preliminary examination. The matter was referred to the Committee of Management.—A letter was read from Dr. F. Wood Jones resigning his appointment as Examiner in Anatomy under the Conjoint Examining Board in consequence of his having been appointed to the chair of anatomy in the University of Adelaide.—It was resolved that Dr. Wood Jones's resignation should be accepted and should take effect on his departure from England in the autumn. It was further resolved that he should be permitted to deliver his Arris and Gale lecture in October next.—The President reported his attendance at meetings of the panel to assist the Minister of Health in the formation of a Consultative Medical Council. A letter was read from Dr. Christopher Addison, stating that, with the advice of the temporary panel constituted in accordance with the terms of his letter of May 27th last, he had framed the list of bodies to be invited to suggest the names of persons suitable to become members of the Consultative Council on Medical and Allied Services to be set up in England under the Ministry of Health Act, 1919, and asking the Royal College of Surgeons of England to furnish him with the names of six persons who, in its opinion, would be specially suitable, if appointed by him, to serve upon the Council as first constituted; pointing out that, while it is desirable that the Minister should, before coming to his decision, have as large a range as practicable of persons willing and suitable to serve only a relatively small proportion of the persons whose names are suggested can in the first instance find a place upon the Council, the total membership of which might with advantage be kept below the maximum number of 20 contemplated by the Order; and stating that the Act provides for the payment to members of the Council of a subsistence allowance and reasonable compensation for loss of remunerative time and for the repayment of travelling expenses. The matter was referred to a committee to consider and report.—Sir George Makins was re-elected President, and Sir Anthony A. Bowlby and Sir John Bland-Sutton were elected Vice-presidents. Sir D'Arcy Power was re-elected a member of the Executive Committee of the Imperial Cancer Research Fund.—The next meeting of the Council will be held on Thursday, July 24th.

UNIVERSITY OF BRISTOL.—The following professorial appointments have been made:—Chair of Education: Helen Marion Wodehouse, M.A., D.Phil., Principal of the Bingley Training College, Yorkshire; Henry Overton Wills Chair of Physics: Arthur Mannering Tyndall, D.Sc., Acting Head of the Department of Physics in the University during the war; Henry Overton Wills Chair of Physiology: George A. Buckmaster, M.A., M.D., D.P.H., Assistant Professor of Physiology in the University of London.

At examinations held recently the following candidates were successful:—

DEGREES OF M.B., CH.B.

Final Examination, Part I. only (including Forensic Medicine and Toxicology).—Hilda Mary Brown.

Second Examination, Part II. (completing examination).—Macdonald Critchley, John Rukin Duerden, and Phyllis Tuckla Siepmann.

DIPLOMA IN DENTAL SURGERY.

Final Examination.—Violette Bourgeois.

Third Examination.—Edward James Tucker.

Second Examination.—Norman Harry Bodenham and Kenneth George Hyland.

DIPLOMA IN PUBLIC HEALTH.

Alison Edgar Wilson.

UNIVERSITY OF MANCHESTER.—The following have obtained the Diploma in Public Health of the University:—

A. W. Baker, G. H. T. N. Clarke, C. J. Crawford, C. C. Hargreaves, A. Heath, J. L. Meynell, E. N. Ramsbottom, H. F. Sheldon, and E. H. Walker.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following candidates have passed the Triple Qualification Examinations:—

FINAL EXAMINATION.

John Stewart Marshall Connell, Robert Berry Forgan, Poon Lip Loh, Thomas Lloyd Edwards, John Kohler Steel, John Fraser Kerr, Shem Stein, Thomas Richard O'Keeffe, William Gibb, Daniel Adrian Stegman, Maurice Julius Woodberg, and Jung Bahadur Singh.

Medicine.—Norman Joseph Patterson, Mandayam Anandampillay Parthasarathy Iyengar, Gordon Beveridge, Thomas Dier, Lewis Rifkind, John Alfred Alexander Duncan, and John Richard Larson.

Surgery.—Thomas Dier, Thomas Ferguson Minford, and Thomas Blaney.

Midwifery.—Norman Joseph Patterson, Mandayam Anandampillay Parthasarathy Iyengar, Gordon Beveridge, Lewis Rifkind, Patabondi Martin Fernando, James Innes Coventry, John Alfred Alexander Duncan, and John Richard Larson.

Medical Jurisprudence.—Thomas Arnoldus du Toit, Andrew Gold, Douglas Chiene Scotland, Thomas Dier, George Murray Shaw Lindsay, William Grant, Henry Godfrey Fitz-Maurice, Jessie Melville Lyall Wright, Joseph Butler Dobson, James MacCashan, James Sydney Alexander Rodgers, Robert Smith, and John Richard Larson.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on July 11th the following candidates, having passed the requisite examinations between March 17th and 20th, were admitted Fellows:—

Joshua Isadore Baeza, Robert Chalmers, James Erlank, Aubrey Scott Gillett, Eben Stuart Burt Hamilton, Maurice Bertram Lawrie, George Millar, Sengarapillai Ponniah, Alan Thomas Roberts, George John Chase Smyth, Harvey Henry Vincent Welch, and John Benson Young.

UNIVERSITY OF ABERDEEN: GRADUATION CEREMONY.—The summer graduation ceremony was held on July 11th, when Sir Douglas Haig and Sir Roger Keyes attended to receive the honorary degree of Doctor of Laws, which was also conferred upon Sir James Cantlie, Emeritus Professor John Theodore Cash, Sir David Hardie (in absentia), member of the Senate of the University of Queensland and late Lieutenant-Colonel, R.A.M.C., Sir James Porter, late Director-General, Naval Medical Department, and Dr. John Scott Riddell, Director of the North-Eastern District Red Cross Society. The following degrees were also conferred:—

DOCTOR OF MEDICINE (M.D.).

Francis James Browne (highest honours for thesis), William Wilson Ingram (commendation), Alfred George Brown Duncan (honours), Archie Keith Fraser (honours), George Adam, Ratan Edulji Dastur, Andrew Smith Leslie, David Murdoch Marr, and Cameron Macdonald Nicol.

BACHELOR OF MEDICINE (M.B.) AND BACHELOR OF SURGERY (CH.B.).

John Allan, Annie Anderson, William Anderson, Margaret Mitchell Chapman, James Sylvester Cook, James Clyne Trigue Crowden, *Elizabeth May Dow, Dorothy Margaret Jane Emslie, William Alexander Falconer, John Fiddes, Alexander Coutts Fowler, †Alexander Edward Gammie (second-class honours), *Coral Ogilvie Gordon (second-class honours), James Ironside Hutcheson, Mary Victoria Littlejohn, Bethia Muir Newlands, Margaret Porteous, Lewis Stevens Robertson, Keith Sarjent Roden, Irene Tomina Joan Ruxton, †George Alexander Shepherd (second class honours), Henry Third, Atholl Thomson, and Louise Tomory.

* Passed Final Professional Examination with distinction.

† Passed Final Professional Examination with much distinction.

The John Murray medal and scholarship were awarded to Dr. George Alexander Shepherd.

UNIVERSITY OF DUBLIN, TRINITY COLLEGE, SCHOOL OF PHYSIC.—At examinations held recently the following candidates were successful:—

FINAL MEDICAL EXAMINATION.

Part I., Materia Medica and Therapeutics, Medical Jurisprudence and Hygiene, Pathology.—Albert Victor John Russell (high marks), George Hall Davis (high marks), Theodor Radloff and Edmund Cyril Smith (equal) (high marks), Francis Victor Small, Joseph Hirschmann, Harold Osmond Hofmeyer, Johan Frederick Wiehe, Mervyn Edmund McBrien, Margaretta Tate Stevenson, Cecil Emrys McQuade and Essie Stuart Smyth (equal), Emily Elspeth Grace Baillie, Barney Moshalowitz, Thomas Falkland Litton Cary and Nannette Norris (equal), William Richard Burns, John Henry Brenell Crosbie, and William Bruce Briggs.

Pathology only (completing examination).—James Alexander Acheson.

Materia Medica and Therapeutics, Medical Jurisprudence and Hygiene.—John Russell Craig, Francis Young Pratt, Robert Sturgeon Chapman, Thomas Gerald Warham, John Douglas Thompson, Albert Stanley Bradlaw, and William Harden Smith.

Richard Victor Dowse, John Carson Brennan, and Henry Allman Lavelle.

Part II., Medicine.—Cyril Daniel Brink, John Charles Joseph Callanan, William Frederick McConnell, and James Sinclair Quin (equal). Gerald FitzMaurice Keatinge and Leslie James Nugent (equal), Jessie Gilbert, Mary Christina Sheppard, Thomas James Russell Warren, Eric Stuart Ewing Mack, Albert William Darnley Magee, and Samuel John Lavesty, Henry Blundell Van der Merwe, and Victor George Walker (equal).

Surgery.—James Sinclair Quin, Albert Hugh Thompson, Richard Counihan, Cecil Joseph Quinlan, Thomas James Russell Warren, Gertrude Rice, Becher FitzJames Haythornthwaite, Frederick William Godbey, Charles Going Ambrose, William Joseph Hogan and Thomas Madill (equal), Patrick Casey, Frederick John Dymoke, and Albert William Darnley Magee.

Midwifery.—Leonard Abrahamson (high marks), Frederick William Robertson (high marks), John Gerard Holmes, John Henry Coolican, Janie Millar Cummins, Harris Cohen, Cyril Daniel Brink, Eileen Hilda Dowse, Thomas Madill, Richard Esmonde Murphy, Thomas Donald Gordon, Francis John Gerard Battersby, Abgar Read Aldin, and Samuel Reginald Hill.

DIPLOMA IN PUBLIC HEALTH.

Part II., Sanitary Engineering, Vital Statistics and Public Health Law, Hygiene and Epidemiology.—Henry Cunningham Mulholland, Beattie Lyons, Robert Condy, Gilbert Marshall, Cecil William Clements Robinson, and Charles Ernest Moore.

QUEEN'S UNIVERSITY OF BELFAST.—At the graduation ceremony on July 9th a distinguished honorary graduate was Viscount Bryce, on whom was conferred the degree of LL.D. Sir David Semple, M.D., had the honorary degree of D.Sc. conferred upon him in recognition of his original researches in enteric fever, tetanus, and bacterial vaccine therapy. Lieutenant-Colonel Robert McCarrison received the honorary degree of LL.D. (in absentia) for his brilliant researches in goitre and the ductless glands, while Lieutenant-Colonel J. A. Sinton, V.C., received the honorary degree of M.D. in recognition of his early distinctions and of his valour in the field. The following degrees by examination in medicine were conferred:—

M.D.—Eileen M. Bell (with distinction and gold medal), Nathaniel Beattie, Joseph Corker, Caroline V. Lowe, James Lyons, and Peter P. Wright.

M.B., B.Ch., B.A.O.—William R. Abernethy, Samuel Ballantine, Hugh Carson, Thomas J. A. Connolly, Eric A. Davison, Samuel Hall, Benjamin Herbert, John M. Hosey, Daniel J. M'Gurk, William C. M'Kee, Thomas H. M'Kenna, Mary M. Merrick, Robert Nimmons, David G. Roulston, Alexander M'M. W. Segerdal, Ruth M. Slade, and Henry W. Wild.

Diploma in Public Health.—Ivie Aird, John B. Alexander, Samuel T. Beggs, James Boyd, Llewellyn D. I. Graham, William M'Dermott, Edward B. C. Mayrs, Thomas Milling, Frederick A. E. Silcock, James Tate, Percival S. Walker, and George Wilson.

THE SOUTH LONDON HOSPITAL FOR WOMEN.—The third anniversary of the opening of the hospital was celebrated on July 9th, when purses representing a total collection of £700 were handed to Lady Carisbrooke. Lady Londonderry, chairman of the board of management, drew attention to the fact that a sum of £7000 was required before the end of the year to meet anticipated ordinary expenditure.

METROPOLITAN HOSPITAL SUNDAY FUND.—The following are among the amounts received at the Mansion House up to July 11th, the total amount being then £56,000:

St. Columba's Church of Scotland, Pont street, £575; St. James's, Piccadilly, £380; Christ Church, Lancaster-gate, £296; Holy Trinity, Sloane-street, £278; St. Paul's, Knightsbridge, £227; St. Peter's, Eaton-square, £214; St. Simon's, Upper Chelsea, £173; St. Jude's, Kensington, £146; St. Stephen's, Avenue-road, £132; St. Stephen's, Gloucester-road, £130; Holy Trinity, Kensington Gore, £122; Greek Church, Bayswater, £121; Essex Church, Kensington, £119; St. Peter's, Cranley-gardens, £109; Christ Church, Mayfair, £103; Cannon Brewery Co., Ltd., £105; St. Mary in the Boltons, £103; Temple Church, £102.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee, held on July 8th, 20 cases were considered and £200 voted to 15 of the applicants. The following is a summary of some of the cases relieved:—

Widow, aged 52, of L.S.A. Lond. who practised at Leyton and died in 1914. Receives £2 10s. per week from the sale of the practice, and £2 from children. Has five children, only the two eldest working, the third at home, and the two youngest at school. Requires help owing to the increased cost of living. Relieved four times, £35. Voted £10.—Daughter, aged 64, of M.R.C.S. Eng. who practised at Blackheath and died in 1881. Suffers from chronic ill-health and is entirely dependent on her sister, who applies for her. Her only income is £5 from investments. Relieved 14 times, £131. Voted £10 in two instalments.—Widow, aged 39, of M.D. Durh. who practised at Tamworth and died in 1917. Was left totally unprovided for with seven children, now aged 17–3 years. Only the eldest is working, and she helps all she can. Applicant receives £150 from dividends, and about £52 by letting rooms. Brother-in-law pays rent, and relations help a little with education. Relieved twice, £30. Voted £12.—Daughters, aged 48 and 47, of M.R.C.S. Eng. who practised at Poplar and died in 1892. They live on the West Coast and take in paying guests, and during the last 12 months have made £70. Rent and rates £79. They find it necessary to apply for help owing to the very short season in 1918, and the increased cost of living. Relieved six times, £60. Voted £10.—Widow, aged 53, of L.R.C.P. & S. Edin. who practised at New Quay and died in 1893. Applicant suffers from ill-health and is unable to work. Has two sons, who are both in the Navy, and help whenever possible. Pays £6 a year rent. Relieved 16 times, £161. Voted £18 in two instalments.—Daughter, aged 67, of M.R.C.S. Eng. who practised at Liverpool and died in 1885. Receives £30 from another charity and £7 from dividends. Lives with sister, and they share the rent, which is £17. Suffers from ill-health and deafness and is unable to work. Relieved five times, £58. Voted £18 in 12 instalments.—Widow, aged 65, of M.B. Dub. who practised at Acton and died in 1912. Applicant was left with four children, now all married and only able to help very slightly. She earns a little by needlework. Has let her flat for £2 2s. a week until July 14th. Rent £50. Unable to manage owing to high cost of living. Relieved three times, £25. Voted £12 in 12 instalments.—Widow, aged 70, of M.D. Glasg. who practised at Dennistoun and died in 1876. Applicant lives with married daughter and is too old to work. She receives £20 from another charity and £48 from children. Suffers from rheumatism and neuritis. Relieved five times, £60. Voted £18 in 12 instalments.—Daughter, aged 65, of L.R.C.P. Edin. who practised at Holloway and died in 1884. Only income £40 a year from another charity. Suffers from ill-health, which prevents her from working. Rent £41. Relieved 15 times, £139. Voted £18 in 12 instalments.

Subscriptions may be sent to the acting honorary treasurer, Dr. Samuel West, at 11, Chandos-street, Cavendish-square, London, W.1.

Sir Arbuthnot Lane, on the invitation of the committee of the French Hospital, Shaftesbury-avenue, will act as senior surgeon to the institution.

Mr. G. G. Henderson, M.A., D.Sc., LL.D., F.I.C., has been appointed Regius professor of chemistry in the University of Glasgow in the room of the late Professor John Ferguson.

THE LATE DR. ARTHUR FULLER.—Dr. Arthur Fuller, who died at Kimberley on June 2nd, was a well-known citizen, having long been a member of the hospital board and school board. He was at the time of his death President of the South African Permanent Mutual Building and Investment Society.

THE CHEMISTS' EXHIBITION.—More than usual interest was taken in the Chemists' Exhibition opened at the Northampton Institute, Clerkenwell, on Monday, July 14th, inasmuch as the occasion marked the revival of a demonstration held annually previously to the war. A period had elapsed, therefore, in which pharmaceutical developments had taken place, and a stimulus had been given to the preparation of so many drugs not before made in this country. These facts made the exhibits peculiarly attractive and served to swell both the number of exhibitors and visitors. Pride was manifest in British manufactures, and the various products shown were a proof that foreign monopoly in this section of industry need no longer exist. Altogether the exhibition was a credit to the great British drug houses, and it is to be followed by a medical exhibition to be held in the Central Hall, Westminster, from Oct. 6th–10th next.

A CREMATORIUM FOR THE CAPE.—The Health Committee of the Capetown Town Council, having had remitted to it for consideration the subject of the establishment of a crematorium in the city, reports that the method of disposing of dead bodies by cremation is, there is no doubt, the most sanitary, but that if a crematorium is to be established it should be under the control of the Burial Board, and not of the municipality. The city council apparently not possessing powers to establish a crematorium, it would be necessary for special legislation to be enacted to enable one to be instituted. In submitting a report from the medical officer of health on English cremation procedure, the committee recommended that the matter be brought to the notice of the Minister of the Interior, Sir Thomas Watt, with a view to a Bill being submitted to the Union Parliament under which a crematorium could be established. The question will be considered by the Cape Municipal Association at the session to be held at Mossel Bay.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.—The annual meeting of the association will be held from Tuesday to Thursday, July 22nd to 24th, at York, under the presidency of Dr. Bedford Pierce. On Monday, July 21st, the council will meet at 5.30 P.M. at the Medical Society's Rooms, 17, Stonegate, York. On Tuesday the annual meeting will commence at 11 A.M. at "The Retreat," when the following officers will be proposed for the year 1919–20:—President: Dr. Bedford Pierce. President-elect: Dr. W. F. Menzies. Ex-President: Lieutenant-Colonel John Keay. Treasurer: Dr. James Chambers. Editors of Journal: Dr. J. R. Lord and Dr. Thomas Drapes. General Secretary: Major R. Worth. Registrar: Dr. A. A. Miller. A paper will then be read by Dr. G. R. Jeffrey entitled "Notes on a Case Treated by Hypnotic Suggestion." At 3 P.M. prizes and medals awarded during the year will be presented, and the presidential address will then be delivered by Dr. Pierce. Dr. G. L. Brunton will read a paper entitled "Notes on the Cytology of the Cerebro-spinal Fluid." The annual dinner will take place at 7.30 P.M. at the Station Hotel, York. On Wednesday, at the Bishop's Room in St. William's College at 10 A.M., papers will be read as follows: "The Value of Treatment by Psychological Analysis," by Dr. J. W. Astley Cooper; "An Analysis of 200 Cases of Mental Defect," by Dr. J. E. Middlemiss. Wednesday afternoon and Thursday are devoted to social entertainment of which a special programme has been issued.

The Services.

THE CASUALTY LIST.

THE names of the following medical officers appear among the casualties announced:—

Accidentally killed.—Capt. R. C. Dickson, R.A.M.C. (S.R.), qualified at Edinburgh in 1911, and joined the R.A.M.C. shortly afterwards.

Died.—Lieut.-Col. J. Gould, C.B.E., I.M.S., was a student at University College, Liverpool, and qualified at Manchester in 1890, and joined the I.M.S. shortly afterwards.

Casualties among the Sons of Medical Men.

Lieut. G. Allison, Gurkha Rifles, killed in action on the Indian frontier on June 8th, 1919, elder son of Dr. T. M. Allison, of Newcastle-upon-Tyne.—Second Lieut. G. M. Dickson, Black Watch, killed in action in France, October, 1918, and Capt. R. C. Dickson, R.A.M.C. (S.R.), accidentally killed on service in India, June, 1919, sons of the late Dr. G. C. Dickson, of Carnoustie, Scotland.

THE HONOURS LIST.

The following awards to medical officers are announced:—

C.M.G.—Surg.-Cmdr. J. Chambers, R.N., for valuable services as operating surgeon at the Royal Naval Hospital, Chatham, since December, 1915.

O.B.E.—Surg.-Cmdr. E. H. J. Browne, R.N., for valuable services as principal medical officer on the staff of the Vice-Admiral Commanding the Battle Cruiser Force. Surg. Lt.-Cmdr. E. L. Markham, R.N., for valuable services in H.M.S. *Caradoc*, 6th Light Cruiser Squadron. Surg.-Cmdr. F. W. Parker, R.N., for valuable services as senior medical officer, R.N. Sick Quarters Invergordon.

D.S.O.—Surg. Lieut.-Cmdr. N. S. Meiklejohn, R.N., for distinguished services in H.M.S. *Caledon*, as Senior Medical Officer, 1st Light Cruiser Squadron.

Military Cross.—Temp. Capt. John Campbell, R.A.M.C., for conspicuous gallantry and devotion to duty north of Sherqat, on Oct. 27th-28th, 1918; he showed great skill and a total disregard of danger in tending the wounded under fire; on several occasions, owing to the intensity of the enemy's fire, he had to move his aid-post, but in spite of all difficulties he managed to evacuate all cases successfully.

The name of Surg. Lieut. W. A. Mallam, R.N.V.R., has been brought to the notice of the Admiralty for valuable services in the prosecution of the war.

Foreign Decorations.—French.—Croix de Guerre.—Col. J. D. Alexander, D.S.O.; Bt. Lt.-Col. (temp. Lt.-Col.) E. B. Bird, D.S.O., R.A.M.C. (T.F.); Temp. Capt. (acting Maj.) A. J. Blake, M.C., R.A.M.C. (T.F.); Temp. Capt. (acting Maj.) A. W. S. Christie, R.A.M.C.; Bt.-Col. (temp. Col.) H. E. M. Douglas, V.C., C.M.G., D.S.O., R.A.M.C.; Capt. (acting Lt.-Col.) W. R. Gardner, D.S.O., R.A.M.C. (S.R.); Capt. C. F. Hacker, M.C., R.A.M.C.; Capt. W. J. Knight, M.C., R.A.M.C.; Lt.-Col. (temp. Col.) L. N. Lloyd, C.M.G., D.S.O., R.A.M.C.; Capt. S. McCausland, M.C., R.A.M.C. (T.F.); Temp. Capt. J. C. Ogilvie, M.C., R.A.M.C.; Maj. (acting Lt.-Col.) D. de C. O'Grady, R.A.M.C.; Capt. (acting Lt.-Col.) E. Phillips, M.C., R.A.M.C.; Lt.-Col. (temp. Col.) H. S. Roch, C.M.G., D.S.O., R.A.M.C.; Temp. Capt. (acting Lt.-Col.) L. D. Shaw, D.S.O., R.A.M.C.; Capt. (acting Maj.) J. R. N. Warburton M.C., R.A.M.C. (S.R.).

Greek.—Medal of Military Merit, 2nd Class: Surg.-Cmdr. T. W. Myles, R.N.

The Territorial Decoration.—The Territorial Decoration has been conferred upon the undermentioned officers of the Territorial Force:—Army Medical Service: Col. G. H. Edington. Royal Army Medical Corps: Lts.-Col. J. S. Warrack, J. Smart, E. J. Cross, John McKie, Maj. (temp. Lt.-Col.) J. M. G. Bremner, Maj. (acting Col.) D. Rorie, Maj. (acting Lt.-Col.) W. F. Roe, Majs. F. W. Batley, H. Stallard, A. F. Rutherford, V. Howard, N. Maclaren, F. B. Jefferiss, H. W. Pritchard, W. Bryce, A. C. Farquharson, F. J. Oxley, W. W. Jones, E. G. Stocker, J. Evans, B. E. Idenbrooke (T.F.R.), J. N. Macmullan, E. M. Dyer, C. J. Martin, H. F. Horne, Capts. (acting Majs.) C. T. Holland, A. P. Watson, Capt. and Qr.-Mrs. J. Boxall, J. H. Maunder.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. E. G. E. O'Leary is placed on Retired List at own request.

W. J. Morris and J. F. Pace to be Surgeon-Lieutenants.

ARMY MEDICAL SERVICE.

Col. T. Du B. Whaite is placed on retired pay.

Temp. Col. A. H. Tubby (Lieutenant-Colonel, R.A.M.C., T.F.) relinquishes his temporary commission on re-posting.

Temp. Col. Sir H. M. Rigby (Brevet Lieutenant-Colonel, R.A.M.C., T.F.) relinquishes his commission on ceasing to be specially employed and on re-posting.

Temp. Col. H. McI. W. Gray (Major, R.A.M.C., T.F.) relinquishes his temporary commission on re-posting.

ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonels relinquish the temporary rank of Colonel on ceasing to be specially employed: E. W. W. Cochrane, L. N. Lloyd.

Major and Brevet Lieut.-Col. M. G. Winder relinquishes the temporary rank of Lieutenant-Colonel on re-posting.

The undermentioned relinquish the acting rank of Lieutenant-Colonel on re-posting: Majors R. E. U. Newman, E. M. O'Neill, R. F. M. Fawcett, W. J. Waters, H. H. A. Emerson, L. V. Thurston (on ceasing to command a Medical Unit); Capts. H. A. Harbison, G. P. Taylor, C. Clarke, F. R. Laing, A. J. Hickey, T. A. Weston, J. R. Hill, H. H. Leeson (on ceasing to command a Field Ambulance); Temp. Capts. J. G. Johnston, K. G. Fraser.

Temp. Lieut.-Col. R. G. Gauntlett (Captain, R.A.M.C., T.F.), relinquishes his temporary commission on ceasing to be specially employed and on re-posting.

The undermentioned to be acting Lieutenant-Colonels whilst commanding Medical Units: Majors A. S. Williams, E. M. O'Neill, A. M. Rose, (Brevet Lieut.-Col.) C. W. Holden; Capts. (acting Majors) T. A. Weston, E. A. Sutton; Temp. Capts. (acting Majors) R. S. Dewar, K. G. Fraser.

Major E. E. Parkes to be acting Lieutenant-Colonel whilst specially employed.

Temp. Capt. J. B. Butler to be acting Major whilst specially employed.

The undermentioned to be Captains: Capt. W. H. Cornelius, from Spec. Res.; Temp. Capts. R. H. Lucas, P. J. S. O'Grady.

Late temporary Captain to be Captain: J. E. English.

Temp. Capt. F. F. Middleweek relinquishes the temporary rank of Major on ceasing to command troops on a Hospital Ship.

Temporary Lieutenants to be temporary Captains: A. H. Marsh, W. H. W. McWhirter, F. P. Hearder, J. Butterworth, D. D. Farquharson, F. H. Nixey, D. H. Vickery.

To be Lieutenants and to be temporary Captains: Capts. M. C. Paterson (from Spec. Res.), P. A. Stewart (from Spec. Res.); Temp. Capts. C. H. C. Byrne, A. J. Bado, G. W. B. Shaw.

Officers relinquishing their commissions:—Temp. Lieut.-Cols. A. Balfour and J. W. W. Stephens (retain the rank of Lieutenant-Colonel). Temporary Majors retaining rank of Major: J. M. Crocker, F. M. R. Walshe, J. C. Pounden, G. Schofield. Temp. Hon. Major G. Hodge (retains the honorary rank of Major). Temp. Capts. J. C. Drysdale, H. Greenwood (on transfer to the R.A.F.), H. E. S. Stiven (granted rank of Lieutenant-Colonel). Temporary Captains granted the rank of Major: R. Edward, D. O. Riddel, H. B. Graham, R. K. Barnie, J. G. Heath, J. H. Jones, D. M. Morison. Temp. Hon. Capt. (acting Major) O. H. Stansfield (granted the honorary rank of Major). Temporary Captains retaining the rank of Captain: C. E. Fenn, D. MacIntyre, E. Morgan, P. A. Rostant, A. M. Rose, C. L. Sproule, O. C. Gruner, J. R. Rees, W. Robinson, R. Park, T. Milling, E. N. Russell, A. F. Galloway, J. M. Johnson, C. A. Lawrence, H. E. Scoones, J. H. Sutcliffe, J. A. Venning, A. J. Rae, D. R. E. Roberts, D. Smith, G. B. Kennedy, W. Roche, M. Davidson, J. Goss, G. T. O Donnell, O. P. N. Pearn, F. W. Rowland, R. J. Hutchinson, G. Deery, V. E. Somerset, J. J. Delany, F. J. Waldmeier, T. G. Wakeling, J. W. Sutherland, T. F. Griffin, D. Watson, F. O. Stedman, C. Bennett, K. J. Yeo, J. L. B. Dixon, A. L. Krogh, J. Appleyard, J. G. Forbes, B. G. Klein, H. V. Deakin, W. Bain, M. Scott, E. Wordley, A. F. Ross, T. H. Campbell, F. H. McCaughey, A. L. Robinson, T. F. Dillon, J. Nunan, A. Langwill, C. H. Burgess, H. G. Frean, A. B. Cheves, L. R. G. de Glanville, N. Matthews, J. Healey, A. W. D. Coventon, M. J. Landy, K. McLay, J. F. Paul, J. L. Pearce, W. McAlpine, C. W. J. Dunlop, R. B. Radcliffe, T. J. D. Quigley, P. C. Leslie, F. S. Turner, W. R. H. Smith, C. G. Adams, H. A. C. Swertz, K. A. Runting, H. Graham, R. W. Ironside, N. MacLeod, F. C. Matthew, A. Rhodes, W. B. Waller, F. W. Grant, H. W. Smartt, A. F. Readdie, C. F. Dew, H. Keighley, C. B. Davies, P. J. Maguire, G. C. F. Roe, E. C. A. Smith, E. E. Paget-Tomlinson, W. L. Stuart. Temporary Lieutenant granted rank of Captain: F. G. McGuinness. Temporary Lieutenants retaining the rank of Lieutenant: R. Ringrose, A. Prentice, J. C. Loughridge, E. W. Dewey, C. H. Lee, E. D. Townroe.

Canadian Army Medical Corps.

Temporary Majors (acting Lieutenant-Colonels) to be temporary Lieutenant-Colonels: S. R. Harrison, C. Hunter, E. R. Selby, W. A. G. Bauld, J. G. W. Johnson, F. H. Mackay, A. E. H. Bennett, W. M. Hart, D. A. L. Graham, A. L. Johnson, R. St. J. MacDonald, R. H. M. Hardisty, T. H. McKillip, H. E. MacDermot, F. A. C. Scrimger, G. A. Platt, G. S. Strathy, G. Musson, J. T. Hill.

Temporary Captains (acting Majors) to be temporary Majors: J. A. M. Hemmeon, F. B. MacIntosh, K. A. MacKenzie, G. W. A. Aitken.

Temp. Capt. A. B. James to be acting Major while employed at No. 11 Canadian General Hospital.

Temp. Major J. McW. Taylor and Temp. Capt. H. A. Mitchell retire in the British Isles.

SPECIAL RESERVE OF OFFICERS.

Capts. W. S. Wallace and A. W. A. Davies relinquish their commissions and retain the rank of Captain.

Capt. W. R. Gardner relinquishes the acting rank of Lieutenant-Colonel on re-posting.

Capt. (acting Major) J. F. W. Sandison to be acting Lieutenant-Colonel whilst commanding a Medical Unit.

TERRITORIAL FORCE.

Lieut.-Col. (acting Col.) E. B. Dowsett relinquishes his acting rank on vacating the appointment of Assistant Director of Medical Services.

Majors (acting Lieutenant-Colonels) relinquishing their acting rank on ceasing to be specially employed: D. F. Todd, J. O. Summerhayes, J. Gray, H. E. S. Richards.

Capt. E. G. Gauntlett is restored to the establishment on ceasing to hold a temporary commission in the R.A.M.C.

Capts. (acting Majors) E. C. Plummer, E. S. Taylor, P. R. Bolus, H. J. D. Smythe, A. L. Sharpin, H. W. Bayly, J. H. Lloyd, and A. W. Stott relinquish their acting rank on ceasing to be specially employed.

Captains to be acting Majors whilst specially employed: A. Rankine, E. G. T. Poynder, H. T. Jones, F. R. Humphreys, K. I. S. Smith.

Capt. J. A. Parsons is restored to the establishment.

Capt. A. Fordyce relinquishes his commission and retains the rank of Captain.

1st Scottish General Hospital: Capt. (acting Major) C. Kerr relinquishes the acting rank of Major on ceasing to be specially employed.

3rd Scottish General Hospital: Capt. (acting Major) R. Fullarton relinquishes his acting rank on ceasing to be specially employed.

5th Southern General Hospital: Capt. (acting Major) P. H. Green relinquishes the acting rank of Major on ceasing to be specially employed, and is restored to the establishment.

2nd Eastern General Hospital: Capt. (acting Major) R. Whittington relinquishes his acting rank on ceasing to be specially employed.

3rd London General Hospital: Capt. (Brevet Major) A. H. Gosse is restored to the establishment.

1st London Sanitary Company: Capt. (Brevet Major) C. C. Frye is restored to the establishment.

ROYAL AIR FORCE.

Medical Branch.—The undermentioned are transferred to Unemployed List: Major H. F. Horne; Capts. (acting Major) A. H. Todd; Capts. M. R. Dobson, T. R. F. Kerby, F. Irvine, J. A. Gordon, D. Cameron (R.A.M.C., T.F.), J. C. H. Allan; Lieuts. A. G. Graham, H. W. Toms, O. F. Conoley.

A. G. Graham is granted a temporary commission as Captain.

Dental Branch.—Capt. J. Barratt is transferred to Unemployed List.

INDIA AND THE INDIAN MEDICAL SERVICE.

The King has approved the retirement of Lieut.-Col. C. T. Hudson and Capt. C. C. Mecredy in consequence of ill-health. The King has also approved the relinquishment of temporary rank of Capt. J. H. Parry.

Medical Corps.—T. F. Pedley to be Lieutenant-Colonel; E. F. Neve and C. H. Elmes to be Captains; and A. D. Cameron to be Lieutenant in the Medical Corps, Indian Defence Force.

Lieut.-Col. A. W. R. Cochrane, Superintendent, King Edward VII. Memorial Sanatorium at Biowati, has been appointed a Civil Surgeon, Second Class, with effect from May 8th. Lieut.-Col. J. C. Lamont resigns. Lieut.-Col. C. H. Bensley, Inspector-General of Prisons, Central Provinces, has been appointed Acting Inspector-General, Civil Hospitals pro tem. The services of Major J. M. Holmes, Deputy Sanitary Commissioner and Health Officer, Imperial City, Delhi, have been replaced at the disposal of Government of India Army Department. Mr. T. Harvey, Sanitary Engineer, will hold charge of the office of Health Officer, Imperial City, in addition to his own duties. Col. M. C. MacWatt, Inspector-General, Civil Hospitals, Punjab, has been appointed Acting Director-General, Indian Medical Service, vice Major-General W. R. Edwards, C.B., C.M.G., on leave in Kashmir. Major R. M. Da'ziel, Superintendent of Central Jail, Multan, has been appointed officiating Inspector-General of Prisons, Punjab, relieving Major W. T. Finlayson. Major W. G. Hamilton has been appointed to act as Superintendent, Presidency Jail, during the absence on deputation of Lieut.-Col. F. S. C. Thompson. Major J. P. Lynch, R.A.M.C., has been appointed to hold medical charge of the Civil Station of Barrackpore, vice Capt. D. J. McLaren, R.A.M.C. Major E. O. Thurston has been appointed Civil Surgeon of Hooghly. Bt. Lieut.-Col. C. A. Gill has been reappointed Chief Malaria Medical Officer, Punjab, on reversion from military duty, relieving Major C. E. Southen, Chief Plague Medical Officer, Punjab, of the additional charge. The services of Major J. E. Clement, Superintendent, Central Jail, Lucknow, and A. W. Overbeek-Wright, Superintendent, Lunatic Asylum, Agra, are placed at the disposal of the Government of India Army Department. Major C. L. Dunn, whose services have been placed at the disposal of the United Provinces Government by the Government of India, has been appointed a Deputy Sanitary Commissioner.

AUXILIARY ROYAL ARMY MEDICAL CORPS FUNDS.

The usual quarterly committee meeting was held on Friday, July 4th, at 11, Chandos-street, Cavendish-square, W., when 12 grants were made to cases in the Benevolent Branch for Officers, amounting to £898. Requests for relief should be addressed to the Honorary Secretary, Sir William Hale White, at 11, Chandos-street, London, W.1.

DEATHS IN THE SERVICES.

A telegram from Aden reports the death of Colonel Jay Gould, I.M.S., C.B.E., formerly Deputy Director-General, I.M.S., Simla. Colonel Jay Gould only recently took up the appointment of A.D.M.S., Aden Forces. He was one of the best-known officers in the I.M.S. Formerly medical officer of the 14th Lancers and Central India Horse, he has been employed as a medical staff officer at Naini Tal and Simla.

URBAN VITAL STATISTICS.

(Week ended July 12th, 1919.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality, which had been 10·0, 9·6, and 10·0 in the three preceding weeks, further rose to 10·1 per 1000. In London, with a population slightly exceeding 4,000,000 persons, the annual rate was 10·0 per 1000, and coincided with that recorded in the previous week, while among the remaining towns the rates ranged from 2·8 in Leyton, 4·2 in Edmonton, and 4·7 in Gillingham and in Eastbourne, to 16·5 in Great Yarmouth, 18·5 in Rochdale, and 18·8 in Brigh on. The principal epidemic diseases caused 117 deaths, which corresponded to an annual rate of 0·4 per 1000, and included 36 from infantile diarrhœa, 28 from measles, 23 from diphtheria, 15 from scarlet fever, 9 from whooping-cough, 4 from enteric fever, and 2 from small-pox. Measles caused a death-rate of 1·8 in Newcastle-on-Tyne; the 2 fatal cases of small-pox belonged to the metropolitan borough of Woolwich. There were 6 cases of small-pox, 1348 of scarlet fever, and 1068 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 2, 1236, and 990 respectively at the end of the previous week. The causes of 31 deaths in the 96 towns were uncertified, of which 9 were registered in Birmingham, 4 in London, and 3 in Carlisle.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality, which had been 11·0, 11·5, and 9·9 in the three preceding weeks, rose to 11·0 per 1000. The 225 deaths in Glasgow corresponded to an annual rate of 10·5 per 1000, and included 6 from whooping-cough, 3 from measles, 2 from infantile diarrhœa, and 1 each from enteric fever and scarlet fever. The 72 deaths in Edinburgh were equal to a rate of 11·2 per 1000, and included 3 from whooping-cough and 1 each from measles and scarlet fever.

Irish Towns.—The 102 deaths in Dublin corresponded to an annual rate of 13·1, or 0·4 per 1000 above that recorded in the previous week, and included 3 fatal cases of infantile diarrhœa. The 90 deaths in Belfast were equal to a rate of 11·7 per 1000, and included 3 from scarlet fever and 1 each from enteric fever and whooping-cough.

Parliamentary Intelligence.

HOUSE OF COMMONS.

WEDNESDAY, JULY 9TH.

Venereal Disease at Hull.

Mr. ROBERT YOUNG asked the Minister of Health whether he had investigated the circumstances attending the deaths of three men within 10 days after treatment for venereal disease at the Royal Infirmary, Hull; what was the drug used; whether it had the approval of his Department; and whether he could supply any information on these cases.—Dr. ADDISON replied: Yes, sir; the three cases occurred in May, and my Department instituted inquiry forthwith. No drug was used, the deaths in each case following on examination only. Fuller investigation is proceeding, and a report will be received in due course.

Finances of Irish Hospitals.

Mr. EDWARD KELLY asked the Chief Secretary to the Lord Lieutenant of Ireland whether the Richmond, Hardwicke, and Whitworth Hospitals, and the Westmoreland Lock Hospital, had hitherto been wholly supported by moneys appropriated by Parliament; whether he was aware that no payment had been made towards the support of these hospitals since April, 1918; that it had been found impossible to finance these institutions on the old grant; that the governors recently resigned; that there was at present no means of paying current maintenance expenses; and if he could say what steps the Irish Government had taken to avoid the necessity of these hospitals having to close down for want of funds.—Mr. MACPHERSON replied: Reference to the Vote for Hospital and Charities (Ireland) shows the estimated income of these hospitals, exclusive of the Parliamentary Grant. In the case of the House of Industry Hospitals, the income, apart from the annual grant of £7600, is estimated at £9205 for the current year. A payment of £3000 on account of this grant was made in April last and a payment of like amount will be made this month. The annual grant of £2600 to the Westmoreland Lock Hospital was paid in April last. Application has been made by the Governors of the House of Industry Hospitals for increased financial assistance from public funds and the Treasury have not seen their way to consent to any increase in the grant of £7600 a year. A further application for assistance has been received from the Board of Superintendence on behalf of the hospitals mentioned in the question and certain other Dublin hospitals that are aided from the Parliamentary Vote. This application is at present before the Treasury. The resignations tendered by the Governors of the House of Industry Hospitals have not been accepted, and the Irish Government has been advised that the responsibility for the management of these hospitals still remains with them.

THURSDAY, JULY 10TH.

Medical Treatment of Soldiers.

Lieutenant-Colonel WALTER GUINNESS asked the Pensions Minister whether he was aware that under existing regulations no provision was made for admission to suitable institutions of men discharged from the Army on account of neurasthenia, melancholia, and epilepsy in Ireland; whether melancholia cases brought on by shell shock and amputation of limbs had in consequence been admitted to lunatic asylums in Ireland where they were treated as pauper lunatics; and whether he would take steps to provide maintenance and treatment for such cases in special institutions.—Sir J. CRAIG (Parliamentary Secretary to the Ministry of Pensions) replied: There are two institutions in Ireland available for neurasthenics. As far as I am aware there are no epileptic colonies in Ireland with which arrangements for the reception of discharged men can be made, and it is therefore necessary to bring the few cases of epilepsy to England. Men are only placed in asylums if they are certified under the lunacy laws, and I am now arranging that men so certified shall be treated as Service patients.

Lieutenant-Colonel GUINNESS: What in effect will be the difference between the treatment of Service patients and the ordinary pauper patient?—Sir J. CRAIG: Oh! very great. Special arrangements will be made by the medical officers. There is a distinct difference between the two classes.

Tuberculous Ex-Soldiers.

Lord HENRY CAVENDISH-BENTINCK asked the Minister of Health whether he was aware that the East Midlands Joint Disablement Committee had 1282 cases of demobilised soldiers suffering from tuberculosis in their area; and whether, in order to provide concurrent training and treatment on the colony system for these men, they applied in October, 1918, to the Pensions Ministry and later to the Local Government Board for financial assistance, but could get no more satisfactory reply than that both Departments were discussing with each other the question of the

treatment of tuberculous discharged men.—Dr. ADDISON replied: I have no recent information as to the total number of demobilised soldiers suffering from tuberculosis in the particular area referred to in the question, but I may say that the number of such cases in residential institutions on July 1st was 183, and the number on the waiting list was 24. The proposal to provide a colony for the concurrent training and treatment of tuberculous men in this area was first brought to the notice of my Department at the end of May when that particular subject of colony treatment had already been specially referred to the Departmental Committee set up by the Minister of Pensions and myself. Their report will, it is hoped, be issued very shortly, and I will then see that suitable steps are taken as soon as possible.

Lord H. CAVENDISH-BENTINCK: Will adequate and immediate steps be taken to carry out the recommendations of the Committee?—Dr. ADDISON: I must see what the recommendations are first.

FRIDAY, JULY 11TH.

Income Limit under the National Insurance Acts.

The report of the resolution declaring it expedient to raise the remuneration for exception from insurance under the National Insurance Acts from £160 to £250 a year was agreed to.

MONDAY, JULY 14TH.

Scottish Board of Health.

Mr. MACQUISTEN asked the Secretary for Scotland if he would state when the Scottish Board of Health was to be constituted in terms of the Act; whether, though unconstituted, it had been acting since July 1st; and whether he would give an assurance that nothing should be done by the Board as at present constituted except routine administration work, and delay all questions of appointments and arrangements for administrative duties until the Board was properly constituted.—Mr. MUNRO replied: I am advised that the Board was duly constituted under Section 1 of the statute, with powers duly exercisable as from July 1st. Its personnel is now complete. Meanwhile only duties of the routine kind referred to by my honourable and learned friend have been discharged.

Tuberculosis Treatment.

Mr. FOREMAN asked the Minister of Health if he could inform the House of the number of persons in the County of London suffering from tuberculosis known to the authorities to require sanatorium treatment and for whom no accommodation was available, and to see whether steps could be taken to utilise as sanatoriums auxiliary or other war hospitals no longer required for war casualties.—Major ASTOR (Parliamentary Secretary to the Ministry of Health) replied: The figures necessarily vary from week to week. There are approximately, as far as the County of London is concerned, some 1700 persons, including children, in residential sanatoriums 500, of whom more than half are children, awaiting entrance. All possible steps are being taken since the diminution of the difficulties occasioned by war conditions to increase the accommodation, including the adaptation of buildings that were provided for war purposes as far as these can be made suitable.

Dr. DELVIN asked the Pensions Minister whether his attention had been called to the treatment of discharged soldiers suffering from tuberculosis; whether he was aware that these men were unable to procure employment because of the disease they suffered from, as no employer wanted consumptive workmen; and whether he would arrange that these men were therefore allowed the full 100 per cent. disablement pension to help them to exist during the few years they might expect to live.—Sir J. CRAIG (Parliamentary Secretary to the Pensions Ministry) replied: The question of tuberculosis as affecting discharged soldiers has recently been considered in all its aspects by an inter-Departmental Committee. Their report is expected within the next fortnight and will be immediately taken into consideration.

Artificial Limbs.

Sir DONALD MACLEAN asked the Pensions Minister whether he would consider the advisability of publishing from time to time in the daily press photographs or sketches of the latest improvements in artificial limbs, so that men disabled in the war might have the latest information for the purpose of enabling them to minimise, as far as possible, the effects of their disability.—Sir J. CRAIG replied: My right honourable friend is obliged to the right honourable Member for his suggestion, and will consider how far it is practicable. Arrangements are being made to exhibit at repair depôts the various artificial limbs available, so as to give a choice of limbs within limits approved by the surgeons to the disabled men.

Sir D. MACLEAN: Will the honourable gentleman let me have a letter, or will he publish a list of these repair depôts, so that disabled men can have an opportunity of knowing where they can go for their information?—Sir J. CRAIG: My right honourable friend is much obliged to the right honourable gentleman for his suggestion, which is quite valuable. In connexion with this and other schemes I am sure he will be only too glad to give the information.

Ad hoc Dental Committee.

Mr. SEDDON asked the Secretary of State for the Home Department whether the ad hoc Committee recommended by the Departmental Committee on Dentistry had been selected; and whether all existing societies of dental practitioners would be included in the selection.—Mr. SHORTT replied: No consideration has yet been given to the formation of the ad hoc Committee referred to in the honourable Member's question. This is a matter that must obviously be postponed until the legislation that will be necessary to give effect to the recommendations of the Dentists Act Committee is in a fair way of accomplishment.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BAXTER, C. B., F.R.C.S. Edin., has been appointed Honorary Assistant Surgeon to the Royal Berkshire Hospital.

FORSYTH, J. A. CAIRNS, M.Sc., M.B., F.R.C.S., Surgeon to the French Hospital, London.

LAKE, NORMAN C., M.D., M.S., D.Sc., F.R.C.S., Assistant Surgeon to Charing Cross Hospital.

LEWIS, THOMAS, M.D., F.R.C.P., D.Sc., F.R.S., Honorary Consulting Physician to the Ministry of Pensions.

LYONS, W. C., M.B. Edin., D.P.H., Assistant Medical Officer (Venereal Diseases, &c.), County Borough of South Shields.

MARTIN, DOUGLAS, M.B. Edin., D.T.M., D.P.H., Assistant Medical Officer (Tuberculosis), County Borough of South Shields.

MATHIESON, D. MORLEY, M.D. Edin., Ch.B., D.P.H., Medical Officer of Health, County Borough of Birkenhead.

OATES, G. E., M.D., B.S. Lond., D.P.H., Medical Officer of Health to the Metropolitan Borough of Bethnal Green.

STILES, Sir HAROLD J., to the Chair of Clinical Surgery in the University of Edinburgh.

WEAR, A. W., M.B. Durh., D.P.H., B.Hy., Assistant Medical Officer (Diseases of Children), County Borough of South Shields.

WHITE, H. V., M.D. Manch., Honorary Ophthalmic Surgeon to the Salford Royal Hospitals.

French Hospital, Shaftesbury-avenue.—MCCLURE, J. CAMPBELL, M.D., Physician to In-patients; FORSYTH, J. CAIRNS, F.R.C.S., Surgeon to In-patients; CROOKSHANK, F. G., M.D., Physician to Out-patients; BROSSY, JEAN, M.D., Physician to Out-patients; ROWE, ROBERT M., F.R.C.S., Surgeon to Out-patients; MCHOUL, JAMES, F.R.C.S., Ophthalmic Surgeon to Out-patients; BRAUN, JEAN, M.D., Physician to Out-patients (Genito-urinary Diseases); HERNAMAN-JOHNSON, F., M.D., Radiologist.

Certifying Surgeons under the Factory and Workshop Acts: KNOWLES, R. O., M.D. Liverp. (Birkenhead); ROBERTSON, A., L.R.C.P., L.R.C.S. Edin. (Dumbarton).

Vacancies.

For further information refer to the advertisement columns.

Birmingham General Hospital.—Res. M.O. £155. Asst. P. £50. Surgical Registrar. £200.

Birmingham, Selly Oak Infirmary and House.—Asst. M.O. £275.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. £150.

Bournemouth, Royal Victoria and West Hants Hospital, Boscombe Branch.—Res. M.O. £250. Also Second Res. M.O. £200.

Brighton, Hove, and Preston Dispensary.—Res. M.O. £200.

Brighton, Sussex Throat and Ear Hospital, Church-street.—Asst. Hon. S.

Bury County Borough.—Asst. M.O.H., Asst. Sch. M.O., and Asst. Tuberc. O. £500.

Bury St. Edmund's, West Suffolk General Hospital.—Res. H.S. £175.

Cairo, Egyptian Government School of Medicine.—Professors and Lecturers. £E.1000 and £E.600. Also Radiologist and Lect. in Radiology, £E.500, Anæsthetist and Lect. in Anæsthetics, £E.500, and Registrar and Tutor, £E.600.

Canterbury, Kent and Canterbury Hospital.—Jun. Res. M.O. £150.

Capetown Free Dispensary.—M.O. £500.

Coventry and Warwickshire Hospital.—Hon. Surg. Staff.

Devonport, Royal Albert Hospital.—Res. H.S. £200.

Dorchester, Dorset County Council.—Asst. M.O. £400.

Dundee Corporation.—Asst. Tuberc. O. and Asst. M.O. £300.

Eccleshall Bierlow Union.—Res. M.O. £800.

Edinburgh City.—Clin. M.O. under Venereal Diseases Scheme. £750.

Elizabeth Garrett Anderson Hospital, Euston-road.—Female Senior Asst. £200.

Exeter, Royal Devon and Exeter Hospital.—Sen. H.S. £250.

Gravesend Hospital.—H.S. £200.

Great Northern Central Hospital, Holloway, London.—Oph. S.

Hospital for Consumption and Diseases of the Chest, Brompton.—H.P.

Isleworth Infirmary.—Sec. Asst. to Med. Supt. £300.

Khartoum, Wellcome Tropical Research Laboratories.—Assistant Bacteriologist. £E.600.

Leeds University.—Lect. in Experl. Phys. £500. Demonstr. in Phys. £250. Demonstr. in Hist. £250.

Leicester Royal Infirmary.—Two Hon. Asst. P. and one Hon. Asst. S.

Liverpool, Fazakerley Sanatorium for Tuberculosis.—Asst. Res. M.O. £250.
Liverpool School of Tropical Medicine.—Asst. Lect. in Parasitology. £250.
Liverpool, Stanley Hospital.—H.P. and H.S.
London Hospital, E.—Surgical Registrar. Also First Asst.
Manchester, Ancoats Hospital.—H.P. £150. Also Hon. P. and Radiologist.
Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill-road.—Hon. Asst. P.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Middlesex Hospital Medical School.—Demonstrator. £200.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. £100. Also Non-Res. M.O. £50.
New Zealand.—Path. and Bact. for Pub. Health Dept., Auckland. £700.
Otago University, New Zealand.—Prof. of Syst. Med., Prof. of Clin. Med. and Therap., and Lect. on Clin. Med. £600, £500, and £400 respectively.
Plymouth, South Devon and East Cornwall Hospital.—H.P. £140.
Queen's Hospital for Children, Hackney road, Bethnal Green, E.—Temp. M.O. 1 guinea per attendance.
Queen Mary's Hospital for the East End, Stratford, E.—Hon. Aural S. Two Asst. Hon. P.'s. Also H.S.
Rossall School, Fleetwood.—Res. M.O. £250.
St. George's Hospital, S.W.—Two Cas. Officers. £150.
St. Helens County Borough.—Asst. M.O.H. £500.
Sheffield Royal Infirmary.—Asst. H.P. £150.
Smyrna Mission and Beaconsfield Memorial Hospital.—Medical Missionary. £250.
South London Hospital for Women, South Side, Clapham Common, S.W. Female H.S. £100.
Surrey Education Committee.—Sch. Dentist. £400.
Taunton, Somerset and Bath Asylum, Cotford.—Asst. M.O. £300.
Tingwall, Whiteness, and Weisdale Parish.—M.O. and Pub. Vac. £45
Tottenham Maternity and Child Welfare Committee, Antenatal Clinic.—Female M.O. £1 11s. 6d. per session.
University College Hospital, Gower-street, W.C.—Res. M.O. £150.
Victoria Hospital, Tite-street, Chelsea S.W.—H.P. and H.S. £100.
West Riding County Council, Treatment of Venereal Diseases.—Asst. £580. Also Sch. Oculist. £450.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Ascot (Berks), Dundee (Forfar), Falkland (Fife), Lavenham (Suffolk), Llantair Caereinion (Montgomery), Newhaven (Sussex), Nottingham, North (Nottingham), Scarborough (York, North Riding), Tynemouth (Northumberland), Wallsend (Northumberland), and Yetholm (Roxburgh).

Births, Marriages, and Deaths.

DEATHS.

FINCH WHITE.—On July 8th, after a few days' illness, of pneumonia following influenza, Finch White, M.R.C.S., L.R.C.P., Vanbrugh Park, Blackheath, London, and Kildaloe, co. Clare, aged 47 years.

HOLDING.—On July 6th, at Hazeldene, Dendy-road, Paignton, S. Devon, Charles Holding, L.R.C.P. & S. Edin., aged 48 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Communications, Letters, &c., to the Editor have been received from—

A.—Dr. A. Ashkenny, Brockenhurst; Dr. R. W. Allen, Lond.
B.—Mrs. C. R. Buxton, Lond; Dr. A. Balfour Lond.; Rev. T. P. Brocklehurst, Giggleswick; Surg.-Comm. W. Bastian, R.N.; Bristol University, Registrar of; *British and Colonial Pharmacist*, Editor of; Mr. I. Back, Lond.
C.—Dr. H. G. P. Castellain, Lond.; Dr. N. H. Choksy, Bombay; Mr. H. G. Commings, Lond.; Prof. E. P. Cathcart, Lond.; Major T. Cherry, A.A.M.C.; Mr. G. D. H. Cole, Lond.; Dr. F. G. Crookshank, Lond.; Dr. J. Cates, St. Helens; Mr. K. Cumming, Lond.
D.—Dublin School of Physic, Registrar of; Prof. S. Delépine, Manchester; Mr. J. Driberg, Lond.; Mr. G. Drage, Lond.; Dr. G. Dundas, Middlesbrough.
E.—Sir G. Evatt, Lond.; Edinburgh Royal College of Surgeons, Clerk to.
F.—Mr. H. A. T. Fairbank, Lond.; Dr. C. E. S. Flemming, Bradford-on-Avon; Mrs. K. Fedarb, Southsea; Mr. R. S. Foss, Lond.; "Fisherman," Torquay.
G.—Dr. S. R. Gloyne, Lond.; Mr. J. N. Glaister, Chertsey.
H.—Major W. E. Home, R.A.M.C.; Prof. I. W. Hall, Bristol; Dr. H. Head, Lond.; Mr. S. Hebarch, Lond.
J.—Mr. M. H. Judge, Lond.
K.—Dr. T. G. Kelly, Desford; Mr. F. Karslake, Lond.; Prof. A. Keith, Lond.; Dr. A. B. Kingsford, Lond.
L.—Mr. E. M. Little, Lond.
M.—Dr. R. A. Morton, Lond.; Major A. Macdonald, R.A.M.C.; Malthusian League, General Sec. of; Medical Women's Federation, Sec. of; Metropolitan Hospital Sunday Fund, Sec. of.
N.—National Council for the Unmarried Mother.
O.—Mr. S. Otabe, Lond.
P.—Dr. B. Pierce, York; Major F. J. W. Porter, R.A.M.C.; Mr. H. C. Palmer, Lond.
R.—Royal Medical Benevolent Fund, Sec. of; Mr. W. Roberts, Westgate-on-Sea; Mr. W. E. Rosedall, Maidenhead.
S.—Prof. W. Stirling, Manchester; Mr. D. M. Shaw, Lond.
T.—Dr. J. Tatham, Oxted; Dr. A. L. Taylor, Liberton; Dr. F. E. Taylor, Lond; Dr. A. T. Todd, Huddersfield.
W.—Dr. F. J. Waldo, Lond.

Communications relating to editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C.2.

Notes, Short Comments, and Answers to Correspondents.

THE BATHS OF OLD LONDON.

BY SEPTIMUS SUNDERLAND, M.D. BRUX.

PART II.

Floating Baths.

The Folly, a "castellated houseboat," was usually anchored opposite Somerset House Gardens soon after the Restoration, and was used as a musical summer-house in part of the seventeenth and eighteenth centuries. Pepys visited this in 1668. It was generally fixed on the south side of the river, near the foot of Cuper's stairs, which led to Cuper's Pleasure Gardens, on part of which the present Royal Waterloo Hospital for Children and Women now stands. During the time of William III. and Mary (1689 to 1702) it was frequented by the fashionable classes, and on one occasion by the Queen. Later it became the resort of a low class of society, was allowed to fall into decay, and was broken up about 1750. It is probable that at one time it was also used as a floating bath.

John Timbs, writing in 1868, mentions the fact that there were two floating baths upon the Thames "in our day," and says that in plan they were somewhat similar to *The Folly*. One of these was situated near Hungerford Bridge, for bathers of both sexes, and contained filtered water.

Sweating Baths.

In England in the thirteenth century the hot-air or vapour baths introduced by the Crusaders were given in establishments called "hot-houses" and were much in request, as were similar ones in the large cities of Europe. The hot vapour baths were tried for leprosy, which was prevalent in those days, as well as for syphilis, but with bad results. There were separate baths for lepers. Shakespeare and Ben Johnson mention sweating baths in their writings as "hot-houses." In the old play, "The Puritan," one of the characters, referring to an arduous undertaking, says, "Marry, it will take me much sweat; it were better to go to 16 hot-houses."

In the year 1517, when there was the second epidemic of the "sweating sickness" in England, the English were accused of gross feeding, of much intemperance, and of causing relaxation of their skins by spending so much time in hot-air baths. This shows that these baths remained popular in England at a time when they were beginning to be less used abroad. Later in England there were periods of comparative disuse until the end of the seventeenth century when they reappeared and became popular in London under the Italian name of "bagnios" (place for sweating) or the Arabic name of "hummum" (a warm bath); these were on the principle of the Roman hot-air or vapour baths. The various bagnios or hummums established in London appear to have become of doubtful repute, and frequented by evil characters; these circumstances led, after a time, to the suppression of the institutions. The practice of cupping was prevalent in those days and for a long time afterwards, associated with hot baths.

The Duke's Bath or Bagnio, minutely described in 1683 by Samuel Haworth, M.D., Physician to James II. when Duke of York, as "erected near the west end of Long Acre in that spot of ground called 'Salisbury Stables,'" was a stately oval edifice, paved with marble, and within the wall were ten seats, such as were formerly in the baths at Bath. When the Duke of York came to the throne in 1686 these baths were improved and reopened as the King's Bagnio, and an advertisement then stated "there is no other bagnio in or about London besides this and the Royal Bagnio in the City," the reference to the "Royal Bagnio" being in all probability intended for the bagnio in Bagnio Court, described below.

The Bagnio (the Royal Bagnio) in Bagnio Court (altered to Bath-street in 1843), Newgate-street, was built by Turkish merchants, and first opened in December, 1679, for sweating, hot bathing, and cupping; 4*s.* was the charge to each person, and certain days were reserved for ladies. Strype wrote: "This bagnio is much resorted unto for sweating, being found very good for aches, &c., and approved of by our physicians." The cupola roof, and walls set with Dutch tiles, were described by Hatton in 1708. It was subsequently used as a cold bath. Dr. Frederick Gervis, of Torquay, informed me that about 1860 he and other medical students of the old St. Thomas's Hospital, Borough, often bathed in this cold plunge bath, which was lined with white marble and was fed by very cold clear water always flowing out of a well-carved white lion's mouth. It was at that time spoken of as the "King's Bath" and was situated in a court on the north side of Newgate-street.

The various bagnios and hummums were again suppressed, but later—namely, in 1765—vapour baths in Cheyne Walk were established by Dominichetti, which were used for a time, medicated with herbs. The Somerset Street Baths, similar to those instituted at Brighton by Mahomed as medicated vapour baths, were in use near the close of the eighteenth century and became popular for years. In "Metropolitan Improvements, or London in the Nineteenth Century," is a print dated 1828, showing the building where the Royal York Baths, Regent's Park, can be seen to this day in York Terrace. They were used until three years ago. The building now contains a fair-sized Turkish bath, with three hot chambers and a shampooing room, which was formerly supplied from a spring, and a rest room. There are also about 12 small bathrooms, with old-fashioned ordinary baths to which pumps are attached. Medicated baths used to be given in these rooms. In 1860 a handsome Turkish bath was erected in Victoria-street, Westminster, but has since been demolished. The Hammam, opened in 1862 in Jermyn-street, St. James's, has been popular for many years and still exists.

Baths and wash-houses.—It is permissible to add that baths and wash-houses for the working classes originated in 1844 with "an association for promoting cleanliness among the poor." A bath-house and a laundry were fitted up in Glasshouse Yard, East Smithfield. The association also gave whitewash and lent pails and brushes to those willing to cleanse their own dwellings. This successful experiment led to the passing of an Act of Parliament "to encourage the establishment of baths and wash-houses," of which there are so many at the present day.

(To be concluded.)

THE WOMEN'S HOLIDAY FUND.

AN appeal emanating from this fund, issued by the Bishop of London and others, pleads for assistance on behalf of poor women and their babies in need of a holiday but unable to afford to go away from home without help. "Never before, perhaps, in the history of this society," says the appeal, "have holidays been so much needed and desired. The strain and anxieties of the long war and the epidemics of influenza, which have left their mark on hundreds of homes, have brought many a poor hardworking woman very near to breaking point. Already applications have been received from women who have not had a holiday for 20 or 30 years, in some cases from those who have never had one in their lives." In 1913 1240 women and 155 babies were sent away, but during the last five years, owing to the high prices and the heavy railway fares, the work of the society has been much limited. Donations will be acknowledged by Miss Cooper, Secretary, Women's Holiday Fund, 76, Denison House, Vauxhall Bridge-road, London, S.W.1.

A PROPHECY OF AVIATION.

To the Editor of THE LANCET.

SIR,—In Henry Maty's "New Review; with Literary Curiosities and Literary Intelligence for the Year 1785" is noticed at some length a book with the title, "Symposia, or Table Talk in the Month of September, 1784, being a Rhapsodical Hodge-podge, containing, among other Things, Balloon Intelligence for the Years 1785, 1786, and 1787." Its publication shows that "flying" had distinctly a vogue in this country nearly a century and a half ago; and Dr. F. J. Poynton's very interesting "details" in THE LANCET of July 5th supports the fact. The following extracts are culled from Maty's "New Review" and taken from the "Table Talk":—

> "We are happy to assure our readers that the Air Carriages are found to be of such utility, that they are daily increasing in number throughout the Kingdom: no less than fifty Balloons were at their moorings in the various inns in Reading, in their way from Bath to London."

Then follows a computation that 100,000 horses which had been engaged in town-to-town traffic were displaced by balloons, and consequently the price of grain had fallen considerably. Again, the officers of the packets conveying the "foreign and Irish mails" were petitioning for pensions, their services no longer being necessary. A traveller from India asserts that he had not suffered from heat when over the "burning sands of Arabia," as he could always "chuse an atmosphere agreeable to the heat of the climate." "Till the wild Arabs have adopted Balloons," he says, "this mode of travelling renders people secure from the plunder of those lawless marauders." A "grand Balloon race over Salisbury Plain for 10,000 guineas" is mentioned, as well as a "grand sweep-stake" between certain ladies, the odds being "greatly in favour of Lady ——, she having been accustomed to soar above the clouds long before the invention of Balloons." A "Man of Fashion" writes a book of 6 vols. 12mo, entitled "Balloon Tales: Being an Account of a Variety of Intrigues carried on in the Air." Leather goes down in price, saddles, bridles, &c., not being wanted. Ox-beef and mutton touch 2½*d.* per lb. at Smithfield "owing to the diminution of horses in this country." In France desertions from the Army are ascribed to the facilities offered by balloons, as also the "easy concealment and escape of villains of all denominations from the hands of justice." The effect of the change upon the medical profession is shown in the following quip:—

> "We hear there will be a great sale of carriages belonging to the Physicians, Apothecaries, Surgeons, Corn-Cutters, and Quack-Doctors in this Metropolis, for it seems the Synod in Warwick Lane have come to a resolution, and have given orders accordingly, that all the above denomination of people, shall either walk or visit their patients in Balloons in future, as the rumbling of chariots is very afflicting to people in fevers and other disorders which affect the spirits; and moreover, as they will be relieved from the expence of keeping carriages, they are to lower the fee in future to half the present sum. We think the resolution redounds greatly to the honour of the College. Indeed, the fees of the Faculty have, of late years, been so exceedingly high, that few people could afford to be ill, and at the same time to be properly attended."

In a synopsis of the other contents of the book this item is curious: "Meditations on a Balloon, by Cadwallader Cruden, son to the renowned Alexander the Corrector." Search for information respecting Jefferies would be facilitated if Dr. Poynton had given the name in full.

I am, Sir, yours faithfully,

Westgate-on-Sea, July 12th, 1919. W. R.

PEACE CELEBRATIONS AND PRECAUTIONS AGAINST FIRE.

WE are glad to note that the British Fire Prevention Committee of 8, Waterloo-place, Pall Mall, London, S.W.1, have issued a timely warning, pointing out the dangers of inflammable materials such as flags and bunting, celluloid, paper lanterns, and other decorative articles commonly used at a time of rejoicing. The public are well advised to bear these precautions in mind. Copies of the warning are obtainable upon written application at the above address.

THE "ADELAIDE" PATENT GARTER.

WE have had submitted to us an ingenious form of garter-suspender, which on the score of economy in material has an advantage over the method of suspending stockings from the shoulder or from the waist. A ribbon of elastic is formed into a figure of 8, the ribbon being kept in place where it crosses by a slotted tab of leather. The two loops having been superimposed they are drawn over the foot and adjusted respectively above and below the knee, the part where the ribbon crosses being placed in the space behind the knee. Means are provided for altering the size of the loops so as to fit the leg. The invention is quite comfortable in use, there is no undue pressure, and the stockings do not wrinkle or get out of place.

MEAL SERVICE IN MILITARY HOSPITALS.

THE problem of serving meals in a military hospital is much the same in the United States as in our Army, but in 1918 special attention was given in the United States to the need for avoiding waste of food. It was necessary that every man should have enough, but that no food should be wasted, as every ounce of surplus food was required for the peoples of Europe, hence the remark of Major R. G. Hoskins, "Every garbage can full of wasted food costs at least one human life," which shows how seriously the United States threw itself into the war. The *Military Surgeon* for March, 1919, shows that there are two systems of serving food in U.S. military hospitals, one is similar to our own, the meals being issued to the patients on their tables; the other, called the "cafeteria" system, in which the patients come into the room, pick up their plates, &c., from a table, and pass a counter where they make a selection of the food they desire, in nature and quantity, from the serving dishes, and then pass to the tables where they eat it. This is a copy of the method in those American restaurants called "cafeterias," where there are no waiters, but each patron walks to the counter and selects his "order" for himself. Opinion seems to be divided as to the system which gives the better result. Patients are instructed to leave at the end a "clean plate," and therefore not to take too much on their plates at first, but, if necessary, to come back for a second helping, and thus it is found that rather more food is eaten than if large helpings are given at first, as the plates, less loaded, look more appetising and encouraging. It is noted by Major A. G. Wilde that constant supervision is required in hospitals to secure that food is well cooked and attractively presented, as well as being properly varied. He also notes what everyone in charge of a hospital not rigidly in routine must have observed, that cooks are always anxious to get away and scheme to have the meals issued earlier than they are ordered, and that consequently the meals are apt to be cold when served.

Captain W. C. Stevenson, R.A.M.C., and Colonel A. E. Webb Johnson, D.S.O., have been appointed Knights of Grace in the Order of the Hospital of St. John of Jerusalem in England.